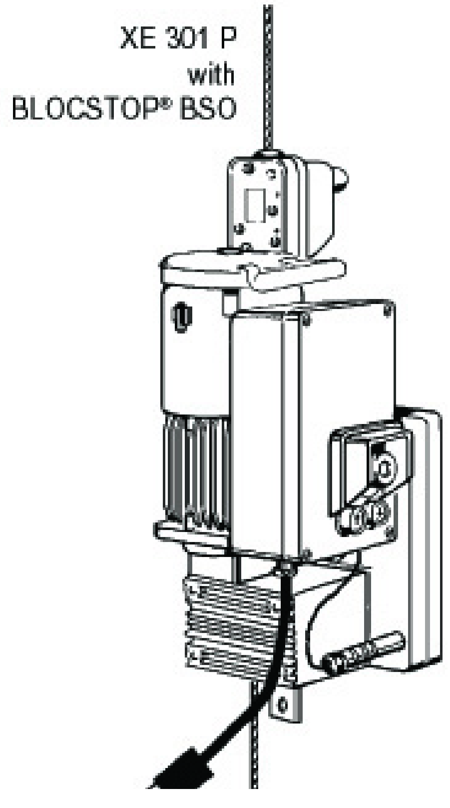
tirak®

XE301P



Date: 06/28/05
Version:1

Service & Maintenance Manual for Electric Powered Hoists

Tractel Group
Griphoist Division

BASIC TROUBLESHOOTING

WARNING

This sheet is to be used by certified Tirak technicians only!

Repair and maintenance of the Tirak hoist should always be accomplished in a safe environment!

The purpose of this sheet is for quick reference only. Most troubleshooting solutions can be found on pgs. 17 & 18 of the Tirak Instruction Manual included with each hoist.

PROBLEM	POSSIBLE CAUSE
High amps and/or heat	Low power
	Centrifugal switch (stuck closed)
	Start capacitor defective
	Stator burned
	Brake drag
	Water damage
	Hoist overloaded
Hoist frozen electrically (ie. Won't run in either direction	Brake rectifier defective
	Run capacitor defective
	Brake coil defective
	Fuse defective
Hoist goes up but not down	Blocstop has been activated
Up and/or Down button does nothing	E-stop button has been activated
	Fuse defective
Hoist goes down when up button is pressed	Centrifugal switch (stuck open) defective
	Capacitor (start and/or run) defective
Hoist will not lift a suspended load	Start capacitor defective
	Low power
Slightly higher amps than normal	Run capacitor defective
Fuse in control circuit blows immediately	Main relay coil short circuit
	Fuse defective
	Thermal protector is burned

Table 001

TABLE OF CONTENTS: TIRAK XE301P1

NOTE:
Throughout the text, parts will be referred to as codes and positions (e.g stirrup bar, Code #47867, Pos. 86). These codes and positions can be found at the end of each chapter in the "Parts Lists" and "Exploded Views".

1) GENERAL INFORMATION

1-1 UL Listing Card

Northbrook, Ilinois (847) 272- 8800
Melville, New York (631) 271-6200
Santa Clara, California (408) 985-2400
Research Triangle Park,
North Carolina (919) 549-1400
Camas, Washington (360) 817-5500

Underwriters Laboratories Inc.®

TRACTEL INC
GRIPHOIST DIV
110 SHAWMUT RD
PO BOX 188
CANTON, MA 02021

TUFV April 18, 2002
Equiptment, Scaffolding

TRACTEL INC GRIPHOIST DIV **SA4785**
110 SHAWMUT RD PO BOX 188, CANTON MA 02021

Electric scaffold hoists, Models ETH-32L, XE301P, maximum load 700 lbs: Models ETH35C, ETH35C3, ETH35X, LE500P, **LE501P**, TE401P, -401PA, XE500P, **-**501P, -501PA, **maximum load 1000lbs**; Models TE1000P, -1001P, -1001PA, XE501PO, XE700P, -701P, XE720P, XE721P, maximum load 1500lbs; Models TE1020P, -1021P, -1021PA, maximum load 2000 lbs; Model XE1020P, maximum load 2400 lbs; Model XE2050P, maximum load 4400 lbs.

Manually operated scaffold hoists, Model TMS-600, maximum load 1320 lbs; Model TU-17, maximum load 1500 lbs; Model TU-28, maximum load 3000 lbs; Model TU-32, maximum load 6000 lbs; Model 408, maximum load 880 lbs.

Pneumatic scaffold hoists, Models ATH32L, -32LB, XA300P, -300PB, maximum load 700 lbs; Models ATH35C ATH35X, -35XB, LA500P, XA500P, -500PB, maximum load 1000 lbs; Models XA700P, -700PB, XA720PB, maximum load 1500 lbs; Model XA1030PO, maximum load 1850 lbs; Model TA1020P, maximum load 2000 lbs; Model XA1020P, maximum load 2400 lbs; Model XA2050P, maximum load 4400 lbs; Model XA2650P, maximum load 5300 lbs.

Independent secondary brakes, Model BS15.301, maximum load 1500 lbs; Model BS20.301, maximum load 3000 lbs; Model BS35.30, maximum load 6000 lbs.

Modular work platform, “Modular Staging”, 2 to 12 m, rated 750 lbs; Models KD01, MP03, 2 to 18m, rated 750 to 1500 lbs; “PFD”, 2 to 15m, load 6000 lbs.

Work Cages, Model PMR0700D, PMR0701D, VSMV-PMR0710D, rated 1000 lbs; Model WC01, rated 400 lbs.

This equipment consists of separate parts inspected at the factory by Underwriters Laboratories Inc. and is intended for use in complete complete installations. Installations are not inspected by Underwriters Laboratories Inc. but should be made in accordance with requirements of authorities having jurisdiction.

LOOK FOR CLASSIFICATION MARK ON PRODUCT

Figure 101

1-2 Model Identification Table

Type Designation of TIRAK Scaffolding Hoist

X SD 5 0 2 P

X E 3 0 1 P 1

Tirak-type

X = 1 driver disc
L = lightweight
T = 2 driver discs
G = Gripwinch (for material handling only, US-version)

Capacity
lbs. [kg]

3 = 700 [300]
5 = 1000 [500]
7 = 1500 [700]
8 = 1600 [800]
10 = 2200 [1000]
16 = 3500 [1600]
20 = 4400 [2000]
30 = 6600 [3000]

Wire Rope
in. [mm]

0 = 5/16 [8]
1 = 1/4 [6]
2 = 3/8 [9]
3 = [10]
4 = [11]
5 = 9/16 [14]
6 = 5/8 [16]

Secondary Brake

1 = BSO500
2 = BS/BSO500

Execution

P = Man riding
PA = 220 V, 1 Ph, 60 Hz, 500 kg for USA/CAN only
PO = with overload
No declaration = material handling

Operation

A = Air operated
D = Dual wire rope Tirak
E = Electric operated Tirak USA/Canada
H = Hydraulic operated
HB = Hydraulic operated with brake
N = Hand crank on motorshift
S = Silo hand crank on gear box

Working Speed f/m [m/min]

	Kind of Motor	50Hz		**60Hz**		for X2000/3000 50Hz		for X2000/3000 60Hz	
0 =	3 Ph	30	[9]	35	[11]	20	[6]	23	[7]
or Air motor or Hydraulic motor									
2 =	3 Ph	60	[18]	70	[22]	50	[12]	45	[14]
3 =	3 Ph	30/60	[9/18]	35/70	[11/22]	20/40	[6/12]	23/45	[7/14]
4 =	3 Ph	15	[4, 5]	17	[5, 5]	10	[3]	12	[3, 5]
5 =	3 Ph	15/30	[4, 5/9]	17/35	[5, 5/11]	10/20	[3/6]	12/23	[3, 5/7]
6 =	3 Ph	15/60	[4, 5/18]	17/70	[5. 5/22]	10/40	[3/12]	12/45	[3, 5/14]
7 =	3 Ph	variable speed, 0 to 35/70/100 [0 to 9/18/30]							
1 =	**1 Ph**	15	[9]	**35**	**[11]**	-	-	-	-
9 =	G	39	[12]	39	[12]	-	-	-	-

Kind of motor

3 Ph = 3 phase motor
1 Ph = single phase motor
G = DC motor

1-3 Test Certifacte XE301P

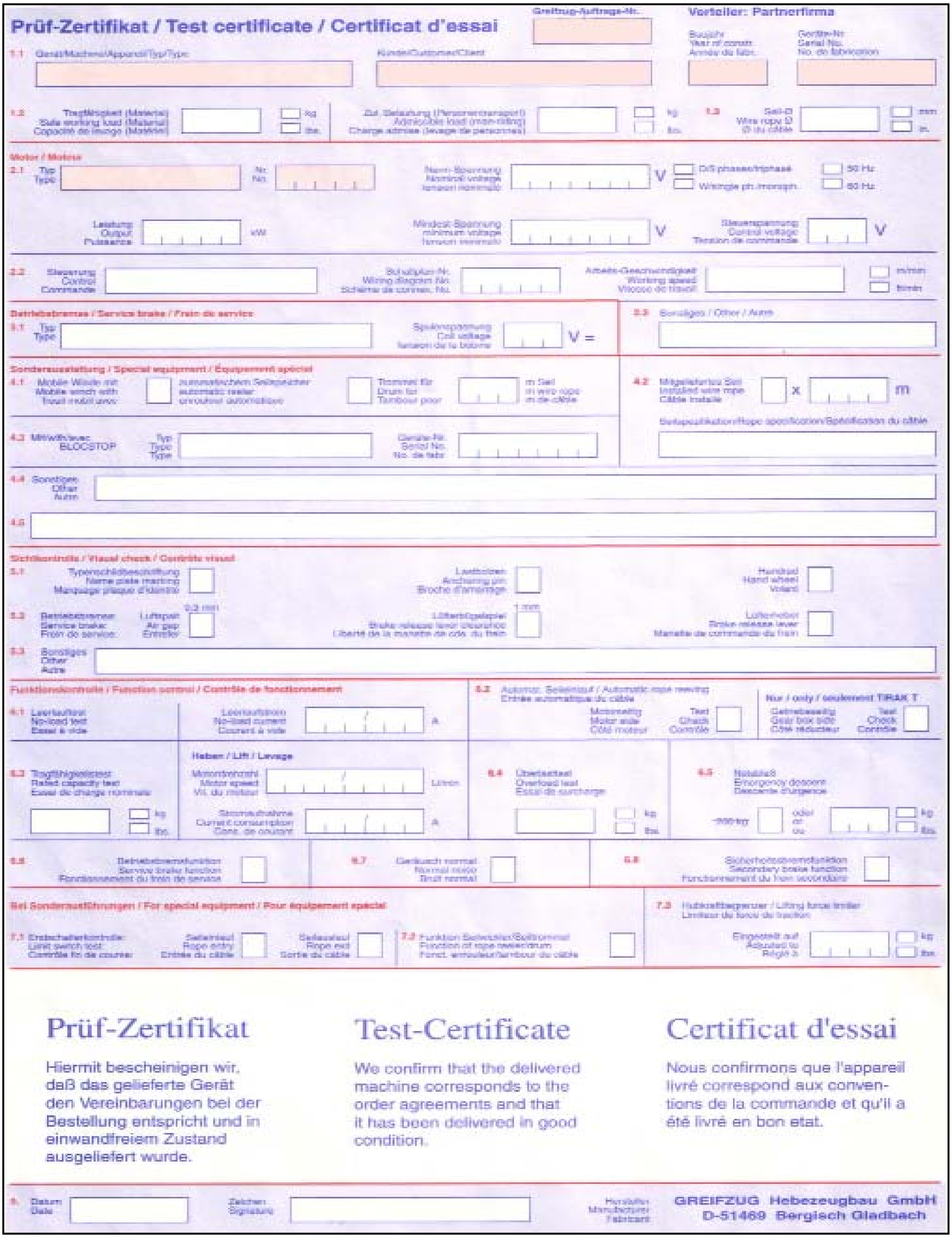


Figure 103

Griphoist Division

2) SECONDARY BRAKE ATTACHMENT XE301P

2-1 BSO500 Secondary Brake Mounting Parts List

#	Code	Qty	Description	Dimensions / Comments
1	45735	1	Blocstop Pin	12 x 68 mm
2	9816	4	Blocstop Washer	Ø 12 / Ø 19 x 1 mm (Qty. as needed)
3	46847	1	Mounting Strap A	163.5 mm w/lug (no bend)
4	67015	1	Mounting Strap B	163.5 mm
5	61645	1	Casing Pin	10 x 66 mm
6	20676	2	Casing Washer	Ø 10 / Ø 16 x 1 mm (Qty. as needed)
7	46496	4	Cotter Pin	4 x 25 mm

Table 201

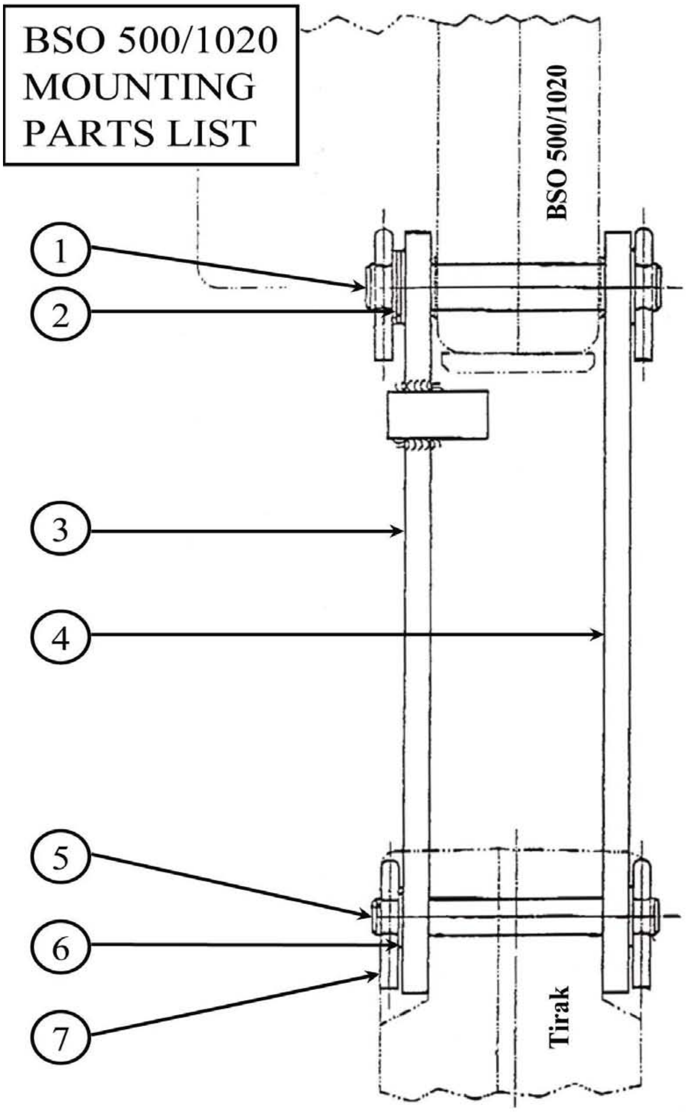


Figure 201

3) WIRE ROPE DRIVING SYSTEM XE301P

3-1 Introduction

NOTE
Regular Inspection services will decrease downtime.

Although the drive system of the Tirak hoist is one of the most simple and reliable system in the market, it still requires service from an authorized repair station for safe and efficient operation. It is recommended the following service procedures are performed every six (6) months but they may need to be repeated more often depending on the work environment the hoist is subjected to.

NOTE
Parts and codes referred to in this section are found on the spare parts list at the end of the chapter (E-27610, Section 3-13).

3-2 Tools Required (Figure 301)

- Hammer
- Screwdriver (2, flat)
- 10mm Box wrench
- Rubber mallet
- Diagonal cutting pliers
- 5 mm Allen key
- Pry Bars



Figure 301

3-3 Blocstop Removal

Using diagonal cutting pliers, detach the Blocstop BSO500 strap from the hoist by removing the cotter pin shown in Figure 302.



Figure 302

3-4 External Inspection

1) Inspect outer casing {Code #63695, Pos. 2} for damage. Pay extra attention to the area indicated shown in Figure 303. Look for deformation or marks that may indicate further damage inside.



Figure 303

2) Inspect the stirrup adapter and the surrounding area as shown in Figure 304 for wear, cracks or damage. If the stirrup bar {Code #47867, Pos. 86} is bent, it indicates improper rigging. Replace if necessary.



Figure 304

3-5 Casing Cover Removal

1) Remove the four (5) cap screw assemblies in the corners (Figure 305) consisting of the following:

   a. M6x50 socket head cap screws {Code #12016, Pos. 31}
   b. Lock-washers {Code #16616, Pos. 32}
   c. Flat washers {Code #36306, Pos. 71}
   d. Square nuts {Code #39356, Pos. 33}
   e. M6x16 socket head cap screw {Code #5336, Pos. 52}

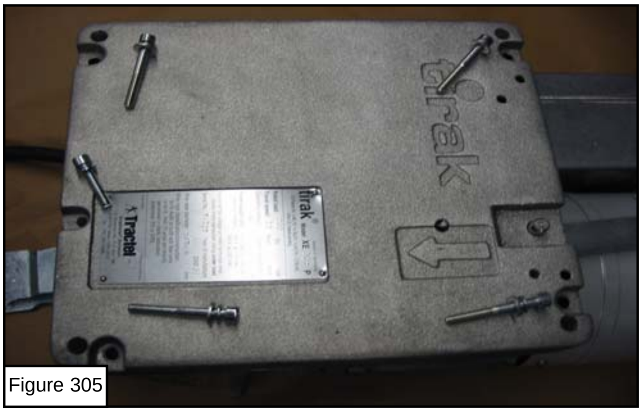


Figure 305

2) Insert a screwdriver in the casing above the stirrup adapter as shown in Figure 306. Carefully pry the casing open.



Figure 306

3) When the cover opens enough, insert a second screwdriver. Begin to lift evenly at the corners of the cover as shown in Figure 307.



Figure 302

4) Inspect inside of cover {Code #63695, Pos. 2} for damage or evidence of wire rope jams (Figure 308) and cracking near the stirrup bar pocket (Figure 309).

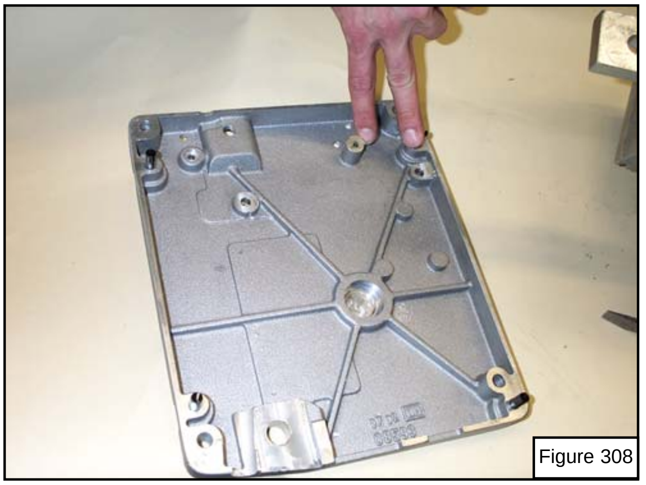


Figure 308

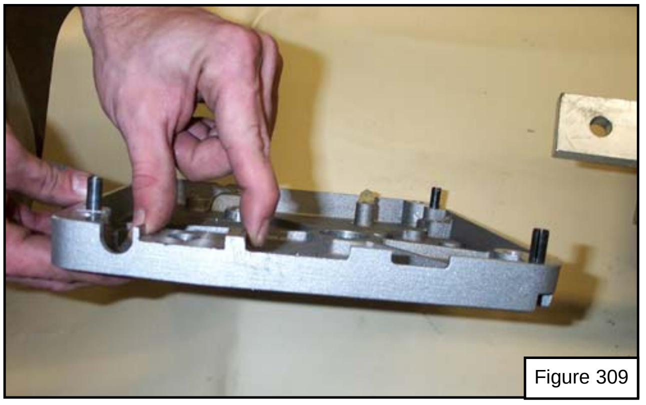


Figure 309

All surfaces should be smooth to prevent cutting or snagging of the wire rope. Replace the cover if it is cracked or distorted.

3-6 Internal Inspection

1) Remove and inspect the stirrup adapter{Code #47867, Pos. 86} in Figure 310. Ensure it is straight and the anchor pin is secure.

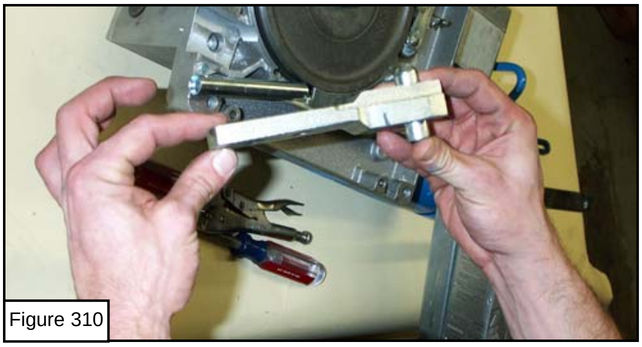


Figure 310

2) Remove and inspect the exit tube {Code #63725, Pos. 41} shown in Figure 311. Ensure it's free of debris inside. Replace as needed.



Figure 311

3) Remove the two socket head cap screws {Code #8926, Pos. 53} and two locking washers {Code #16616, Pos. 32} in Figure 312 & 313.

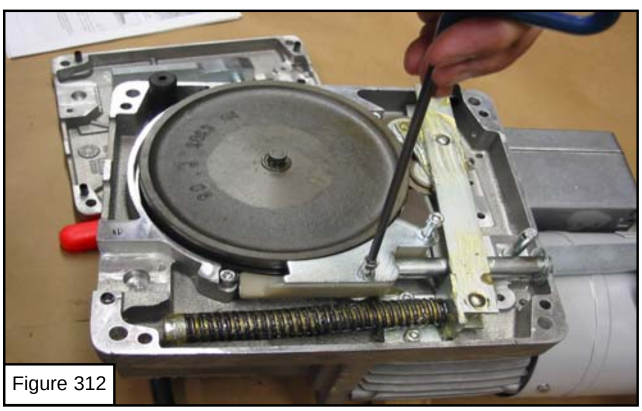


Figure 312

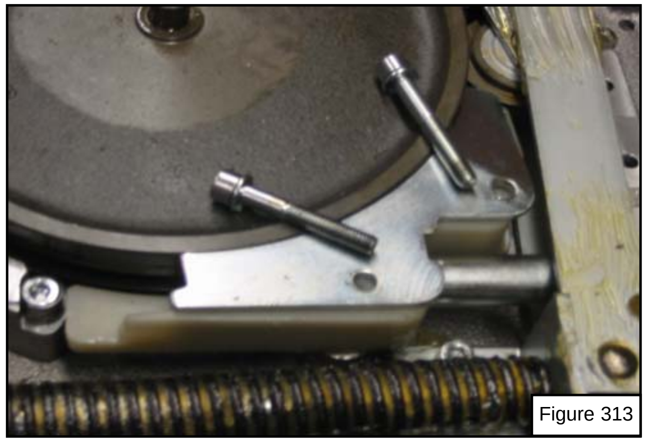


Figure 313

4) Inspect the upper wire rope guiding plate {Code #63715, Pos. 46} and compare it to Figures 314 and 315.



Figure 314

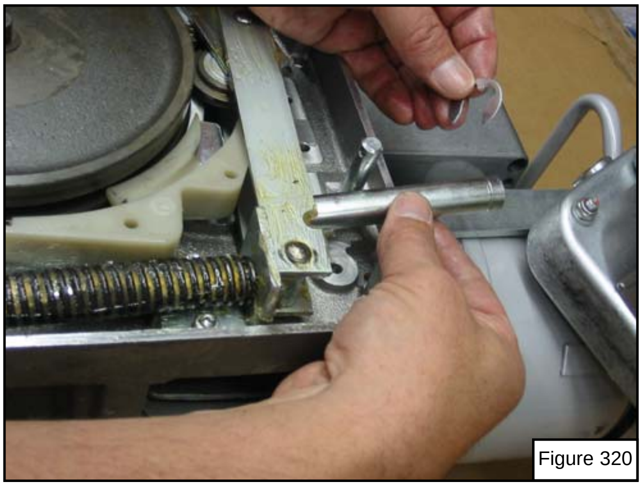


Figure 315

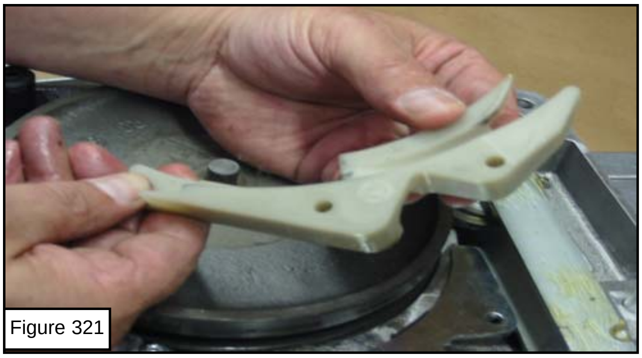
Figure 315 shows how the guiding plate should look like. Figure 314 shows a bent or damaged wire rope guiding plate which must be replaced.

NOTE
IF the plate shows damage, this indicates a wire rope jam has occurred and the pressure system must be carefully inspected.

5) Remove the entrance tube {Code #40365, Pos. 49} and snap ring {Code #6846, Pos.57} as shown in Figure 320. Inspect the entrance tube and snap ring for damage. Ensure the entrance tube is free of debris. Clean or replace as necessary.


Figure 320

6) Inspect the wire rope guiding device {Code #63705, Pos. 47} in Figure 321. Replace as necessary.


Figure 321

7) Inspect the lower wire rope guiding plate {Code #40405, Pos. 48, Figure 322} for wear or damage. Replace as necessary.


Figure 322

8) Inspect the wire rope guiding band {Code #24187, Pos. 9} (Figure 323) for wear or damage. Replace as necessary (See Section 3-10).


Figure 323

9) Remove screw bushing located under wire rope guiding device assembly (Figure 324).


Figure 324

10) Inspect the two roller pressure system {Code #23257 Pos. 80} shown in Figure 316. This inspection must be carried out every time the casing cover is removed.

Perform the following check to determine if damage has occurred to the system:

a) remove pressure system pin (Figure 325).



Figure 325

b) check taper on pressure system pin (Figure 326).

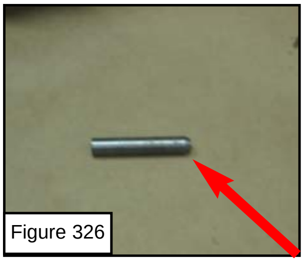


Figure 326

c) remove the two pressure system screws {Code #7146 Pos. 77} (Figure 327).

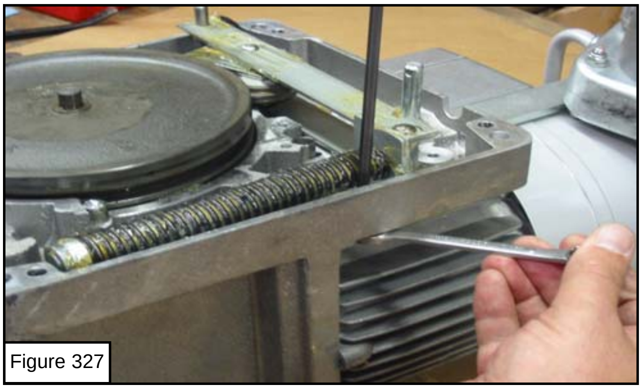


Figure 327

d) Be careful not to lose the two spring wahers {Code#16616 Pos. 32} and nyloc nuts {Code #7996 Pos.81}.(Figure 328).



Figure 328

e) Inspect the pressure system {Code #23257 Pos. 80} with a straight edge to make sure there are no deformations. (Figure 329).



Figure 329

f) Inspect the pressure system's pin to ensure the rollers are held in place. (Figure 330).



Figure 330

g) Inspect the rollers to ensure they roll freely and are not damaged. (Figure 331).


Figure 331

11) Inspect the carryimg handle for damage and {Code #40335 Pos. 34} shown in Figure 332.


Figure 332

NOTE
The regular service inspection is now complete. Clean all components with mineral spirits and dry thoroughly.

3-7 Reassembly

1) Re-grease the pressure system {Code #23257, Pos. 80} with wheel bearing or white lithium grease.

⚠ WARNING ⚠

DO NOT use molybdenum disulphide (moly-b) grease or graphite type grease!

2) Reinstall the lower guide plate {Code #40405, Pos. 48, Figure 322}, wire rope guiding device {Code #63705, Pos. 47, Figure 321} and upper guide plate {Code #63715, Pos. 46, Figure 312}.

3) Reinstall the wire rope entrance tube {Code #40365, Pos. 49} and snap ring {Code #6846, Pos.57} in Figure 320. Place the snap ring onto the entrance tube rotate it so the tabs are up. This extra bit of clearance eases installation of the casing cover.

4) Reinstall the exit tube {Code #63725, Pos. 41, Figure 311}. Ensure the tube is not blocked.

5) Reinstall the stirrup anchor bar {Code #47867, Pos. 86, Figure 310}.

3-8 Casing Cover Installation

1) Using a hammer and dowel punch, gently tap the roll pins (clamping sleeves) flush into the casing cover (#63695, Pos. 2, Figure 333).


Figure 333

2) Carefully place the casing cover over the pressure system dowel pin. Ensure it sits directly over the pin!!! (Figure 334).


Figure 334

3) Place one hand on the casing cover. Using a dead blow RUBBER mallet, tap the cover onto the base as shown in Figure 335.

NOTE
Keep pressure on the cover to prevent damage to the cover.


Figure 335

4) Using a hammer and dowel pin, realign the roll pins flush with the base.

5) Reinstall the M6 casing cover screws, washers and square nuts (See Figure 305).

6) Reinstall the Blocstop straps and Blocstop.

CAUTION

Ensure that the cotter pins are bent completely over to prevent any sharp edges.

7) Load test the hoist and check the Blocstop functions properly.

NOTE
General service of the wire rope drive system is now complete. If during the general service damage was discovered proceed as follows.

WARNING

It is prohibited to attempt repair of the pressure system.

3-9 Pressure System Replacement {Code #23257, Pos. 80}

If damage has occurred to the pressure system by a rope jam (see Section 3-6, Step 4), the pressure system must be replaced.

1) Carefully remove the pressure system dowel pin by lifting it straight out its position. Be sure not to damage the pin. If damage does occur, gently remove any burrs with emery cloth.

2) Lift the pressure system from the casing base. Replace the unit.

3) After removal of the old system replace it with a new unit {Code #23257, Pos. 80}.

5) Install the pressure system dowel pin into the casing base first.

6) Grease the pressure system with wheel bearing grease or white lithium grease.

WARNING

DO NOT use molybdenum disulphide (moly-b) grease or graphite type grease!

3-10 Wire Rope Guide Band Replacement {Code #24187, Pos. 9}

Though replacement is rare, it may be necessary if damaged beyond repair. This procedure requires that the drive sheave is removed.

1) Remove the oil drain plug as shown in Figure 336. Ensure that gearbox is lying with the oil plug to the high side to prevent excessive oil loss. This will allow air pressure to neutralize in the gearbox.

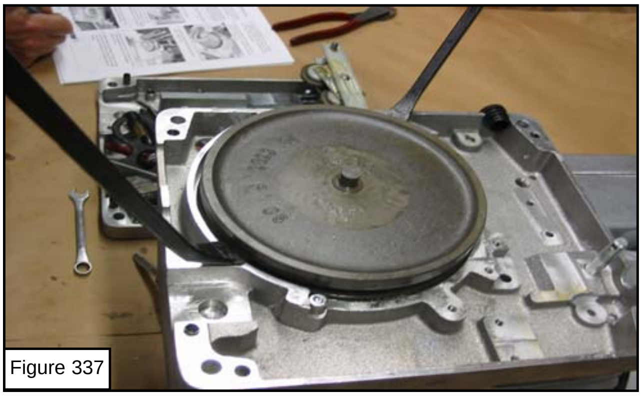
2) Reinstall the oil plug. Do not apply too much torque.

NOTE
You will be removing the oil plug again.


Figure 336

3) Turn the gearbox over so the driver disc {Code #22357, Pos. 4} is face up. Use a block of wood to level the gearbox. Remove the wire rope guiding device (see Section 3-6, step 6).

4) Carefully with two pry bars remove the driver disc as shown in Figure 337.

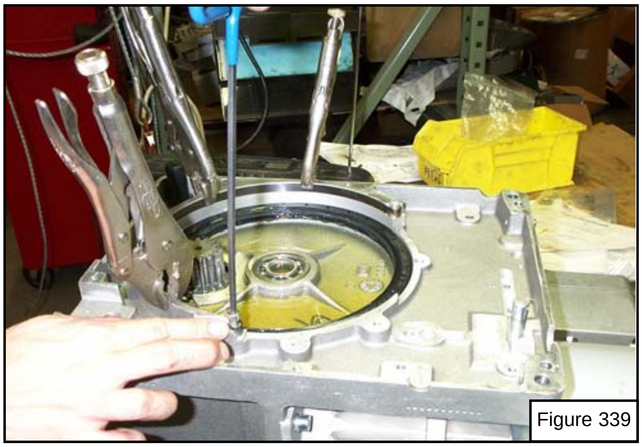

Figure 337

5) Remove the damaged wear band. Inspect and repair the casing base retaining lip as needed. Place a light coat of grease on the back of the new wear band.

6) Install the new wear band. Make sure the band sits firmly into the casing base recess as shown in Figure 338.


Figure 338

7) Using vise grips, twist the band into the recess (Figure 339).


Figure 339

8) Reinstall the driver disc to the gearbox. There will be resistance due to the air trapped below the disc.

9) While holding the sheave in place, turn the hoist over so that the oil plug is to the high side again. Remove the oil plug same as before.

10) Press or use a rubber mallet to push the sheave into place. The air will expel from the oil plug. The sheave should move into position as air escapes (Figure 340).

NOTE
DO NOT stand in front of the oil plug hole as oil may spray.

11) Reinstall the oil plug and tighten.


Figure 340

3-11 Radial Packing Ring Replacement {Code #39516, Pos. 10}

Replacement is only necessary if oil is leaking and the original packing ring is damaged (cut or bent).

1) Remove the oil plug, pressure system, wire rope guiding device and driver disc as above.

2) Clean the area carefully.

3) With two pry bars gently remove the old packing ring. Do not damage the base.

4) Lightly grease the new packing ring and place it in its position.

5) Using a brass punch or wooden dowel, tap the packing ring into its position. Tap alternately at the 12-6-9-3 o'clock positions as shown in Figure 341.


Figure 341

6) Reinstall the driver disc and remove excess air as in Section 3-10.

3-12 Driver Disc Bearing Replacement {Code #23836, Pos. 35}

Though this is rarely required proceed as follows.

1) Follow the procedure as above. Do not remove the radial packing ring.

2) Carefully remove the driver disc with two pry bars.

3) Inspect both top and bottom bearing for wear or damage (Figure 342).


Figure 342

4) If replacement is necessary, using the correct gear puller remove the bad bearing as shown in Figure 343.



Figure 343

5) Reinstall the new bearing and gently seat using a press.

6) Reinstall the driver disc. (Follow the procedure as outlined in Section 3-10)

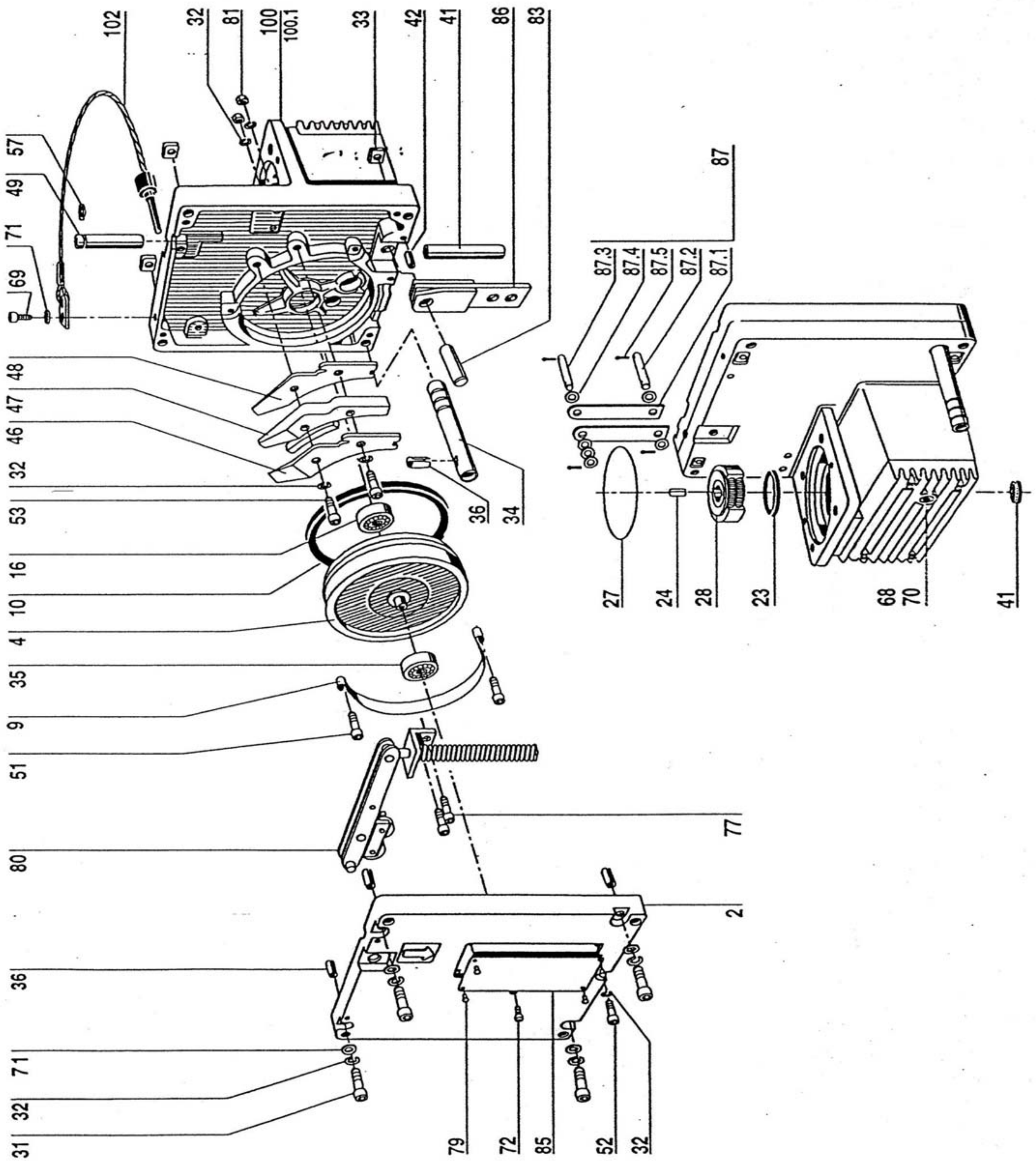
7) Reinstall all drive components as in an outlined in Section 3-7.

8) Reinstall the casing cover per Section 3-8.

Spare Parts	XE301P - 110V Wire rope drive	Drawing No 27610 Edition US-1 Date 1/05 Page 1 / 2

Position	Part #	Qty.	Description	Specifications	List Price
--	22048	1	Wire rope drive complete X300	700#, 8mm	$2,618.47
2	63695	1	CASING COVER X300		$204.39
4	22357	1	DRIVER DISC FOR WIRE ROPE DIA.8 MM	8mm	$546.10
9	24187	1	WIRE ROPE GUIDING BAND,COMPLETE F. 8 MM		$25.44
10	39516	1	RADIAL PACKING RING 160/180/10	160x180x10	$32.76
16	40996	1	BALL BEARING 6201	12x32x10	$7.27
23	39306	1	SHAFT SEAL 25/52/7	25x52x7	$9.47
24	39316	1	KEY A 5X5X45 DIN 6885	5x5x45	$0.39
27	41996	1	O-RING FOR MOTOR SIZE 80 120 X 2,5	120x2.5	$4.77
28	39346	1	CENTRIFUGAL BRAKE 1500 U/MIN	1900 rpm	$137.16
31	12016	4	SOCKET HEAD CAP SCREW M 6X50 DIN 912	M6x50	$0.39
32	16616	9	SPRING WASHER A6 DIN 127	A6	$0.13
33	39356	4	SQUARE NUT M6 DIN 557	M6	$0.26
34	40335	1	CARRYING HANDLE		$23.14
35	23836	1	Ball bearing 6201-2RS1	12x32x10	$9.82
36	39366	5	ROLL PIN 8 X 30 DIN 7346	8x30	$0.61
39	39376	1	CUP SEAL	32x9.5	$9.47
41	63725	1	Wire rope exit tube X300	X300 S/N > 5336	$0.00
42	16286	1	ROLL PIN 8 X 12 DIN 7346	8x12	$0.39
46	63715	1	UPPER WIRE ROPE GUIDING PLATE	X300 S/N > 5336	$10.97
47	63705	1	WIRE ROPE GUIDING DEVICE F. 8 MM	X300 S/N > 5336	$58.64
48	40405	1	LOWER WIRE ROPE GUIDING PLATE		$6.66
49	40365	1	WIRE ROPE ENTRY TUBE		$10.82
51	4186	2	Socket head cap screw	M6x16	$0.00
52	5336	1	Socket head cap screw	M6x30	$0.00
53	8926	2	SOCKET HEAD CAP SCREW M 6 X 40 DIN 912	M6x40	$0.26
57	6846	1	Retaining washer		$0.00
68	37646	1	Oil plug screw for petroleum gearboxes	M16x1.5	$3.76
69	4176	1	Socket head cap screw	M6x20	$0.00
70	37656	1	Copper gasket for gearbox oil plug	16x22x1.5 - Cu	$0.39
71	36306	4+1	WASHER A 6,5X14X1,6 DIN 6902	A6.5	$0.56
72	41006	1	SOCKET HEAD CAP SCREW M6X10 DIN 7984		$0.46
77	7146	2	SOCKET HEAD CAP SCREW M 6 X 25 DIN 912	M6x25	$0.26
79	16236	4	RIVET 2 X 6 DIN 1476	2x6	$0.13
80	23257	1	PRESSURE SYSTEM COMPLETE		$334.61
81	7996	1	Nyloc nut	M6	$0.15
83			included with pos. 86 (one piece design)		
85	22760	1	Tirak nameplate	Metal	$9.47
86	47867	1	Tirak stirrup adapter		$86.98
87	42487	1	Brake coil assembly	FDB 13 / 96V	$0.00
87.1	66145	2	BS/BSO Pin	10x72	$10.82
87.2	61645	1	Tirak pin	10x66	$12.42
87.3	45735	1	Blocstop pin	12x68	$7.12
87.4	9816	6	WASHER 13 X 19 X 1 DIN 988	13x19x1	$2.01
87.5	46496	4	COTTER PIN 4 X 25 DIN 94	4x25	$0.26
100	41747	1	Casing base without gears X300	for motor size 80	$586.07
100.1	42707	1	Casing base with gears X300	for motor size 80	$1,917.80
102	14347	1	Control descent pin with lanyard		$18.93

Spare Parts	XE301P - 110V Wire rope drive	Drawing No 27610 Edition US-1 Date 1/05 Page 2 / 2



4) GEARBOX

4-1 Required Tools (Figure 401)

- 17 mm wrench or adjustable wrench
- Allen keys 8 mm, 5 mm
- internal and external snap ring pliers
- 2 pry bars
- 2 screwdrivers
- 1 gear puller
- 1 plastic or rubber mallet
- Brass punch
- Rags or towels



Figure 401

4-2 Gearbox Disassemby

The following procedure is for complete disassembly of the gearbox. We recommend that the procedure be carried out by a Tirak repair facility. If repair is essential at the site proceed as follows:

1) Remove the 4 {Code #26097, Pos. 12, refer to E-3075, Section 3-13} M5x10 mm screws as shown in Figure 402. Remove the motor per Section 6-1.

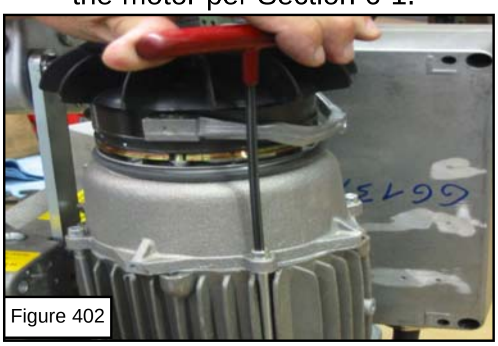


Figure 402

2) Remove the casing cover and internal drive parts as shown in Figures 403, 404, 405, 406, 407, 408 and 409.



Figure 403

2a) Remove all the casing cover screws {Code #12016 Pos. 31, & Code #5336 Pos. 52 refer to 27610, Section 3-13} and pry off the casing cover {Code #63695, Pos. 2, refer to 27610, Section 3-13} as shown in Figure 404.



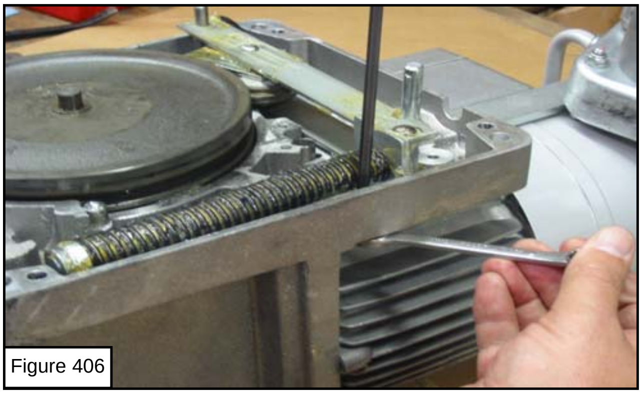
Figure 404

2b) Remove the exit tube {Code #63725, Pos. 41, refer to 27610, Section 3-13} as shown in Figure 405.



Figure 405

2c) Remove the pressure spring {Code #23257, Pos. 80, refer to 27610, Section 3-13} as shown in Figure 406.


Figure 406

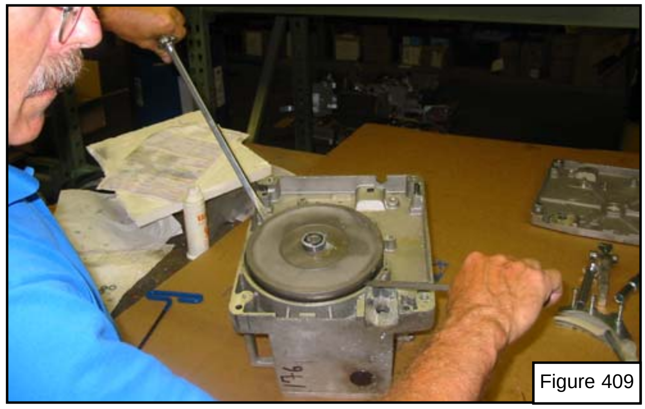
2d) Remove the inlet tube {Code #40365, Pos. 49, refer to 27610, Section 3-13} as shown in Figure 407.


Figure 407

2e) Remove the guiding device {Code #63705, Pos. 47, refer to 27610, Section 3-13} held in place by 2 screws {Code #8926, Pos. 53, refer to 27610, Section 3-13} as shown in Figure 408.

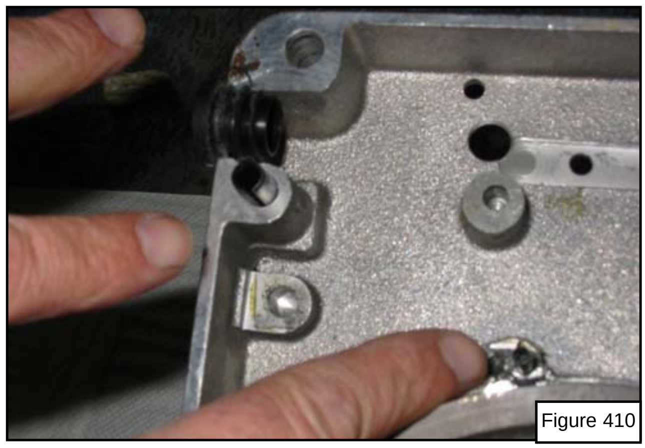

Figure 408

2f) Pry off the driver disc {Code #22357, Pos. 4, refer to 27610, Section 3-13} using 2 large screwdrivers as shown in Figure 409.


Figure 409

2g) Remove the following items from the gearbox casing (Figure 410):

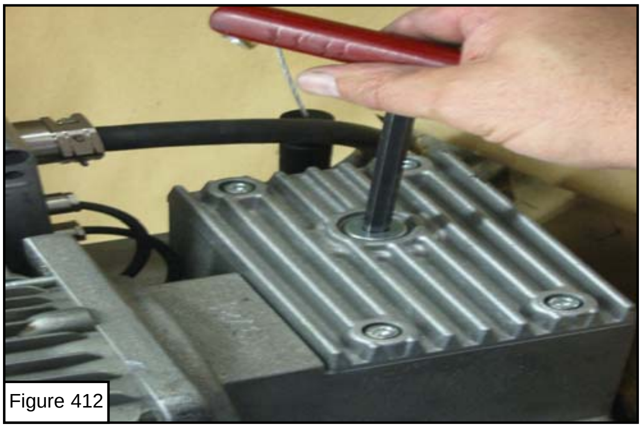
- Plastic plug {Code #67746, refer to 27610, Section 3-13}
- Wearband pins


Figure 410

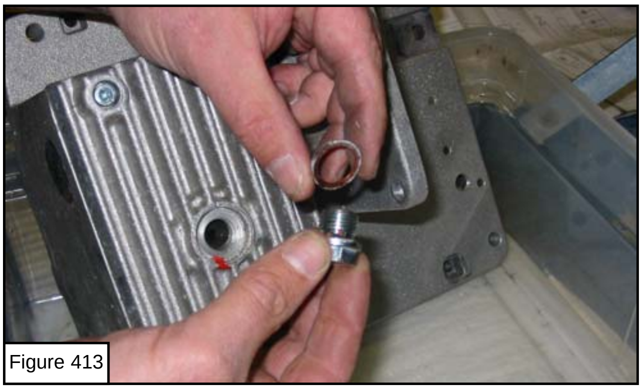
2h) Remove the (4) roll pins {Code #39366, Pos. 36, refer to 27610, Section 3-13} should they have remained inside the base as shown in Figure 411.


Figure 411

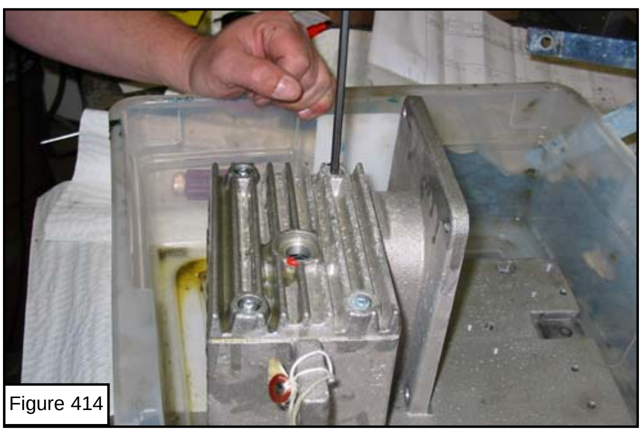
3) Using a 10 mm hex, remove the oil plug {Code #37646, Pos. 68} and drain the synthetic gear oil into a clean bucket. Inspect the oil for brass flakes or metal filings (Figure 412).


Figure 412

4) Inspect the plug and copper gasket {Code #37656, Pos. 70} for wear or damage as shown in Figure 413. Replace if necessary.


Figure 413

5) Remove the (4) M6x20 socket head screws {Code #4176, Pos. 69} as shown in Figure 414.


Figure 414

6) Rotate the gearbox cover {Code #40505, Pos. 3} slightly with a brass hammer (or soft hammer) and tap upwards as shown in Figure 415.


Figure 415

7) Carefully pry off the gearbox cover {Code #40505, Pos. 3} as shown in Figure 416. Avoid damaging the casing base.


Figure 416

8) Inspect the cover {Code #40505, Pos. 3} for damage (Figure 417). Replace the ‘O’-ring {Code #39286, Pos. 12}.


Figure 417

9) Remove the snap ring {Code #536, Pos 13} that sits on the input shaft (Figure 418).



Figure 418

10) Remove the seal {Code #39306, Pos. 23, Figure 419}. The seal is destroyed during removal and must be replaced after reassembly of the gearbox.

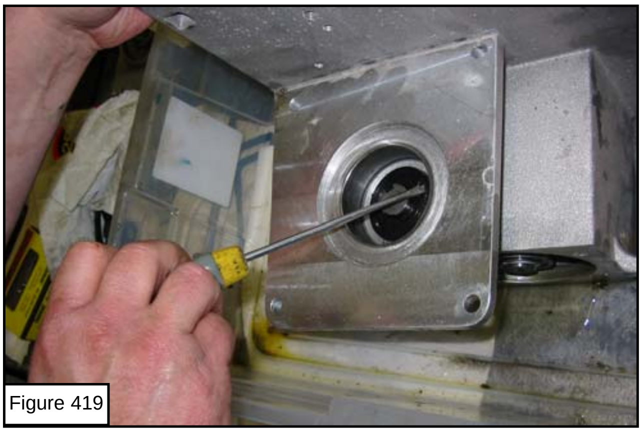


Figure 419

11) Remove the large internal snap ring {Code #16576, Pos. 22} as shown in Figure 420.

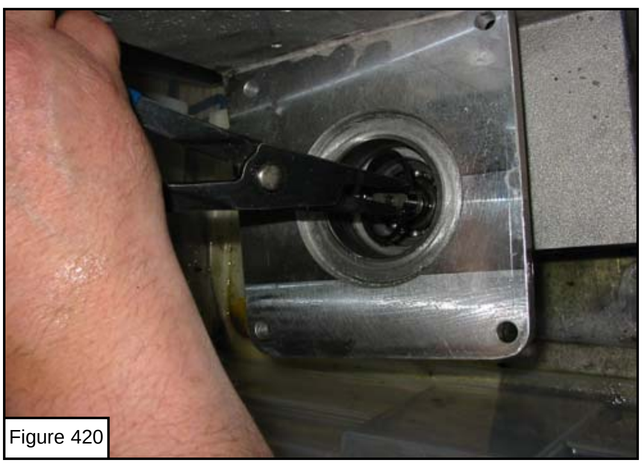


Figure 420

12) Remove any and all spacers {Code #25136, Pos. 21} as shown in Figure 421.



Figure 421

NOTE:
There may be more than one spacer below the internal snap ring.

13) Carefully turn the gearbox over and remove the cup seal {Code #39376, Pos. 39} at the bottom of the hoist as shown in Figure 422. Dispose of the old seal.



Figure 422

14) Remove the internal snap ring {Code #37796, Pos. 38} under the cup seal (Figure 423).



Figure 423

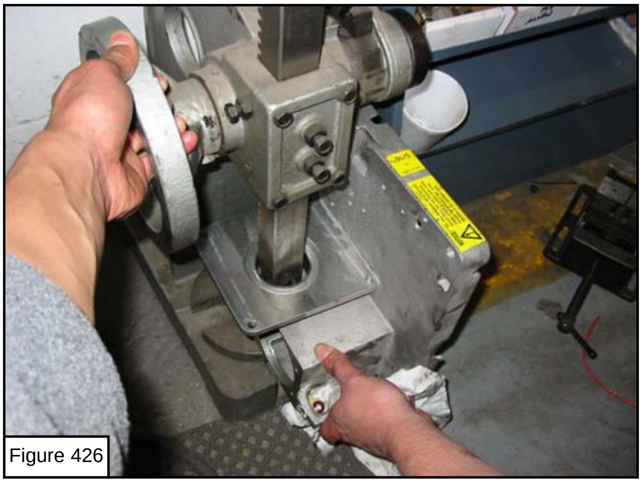
15) Using a rubber dead blow mallet, hit the shaft pinion {Code #22367, Pos. 5} as shown in Figure 424. After several careful hits, the pinion gear assembly should come out through the front of the gearbox.


Figure 424

16) Inspect the pinion and bearing for any wear, damage, or discoloration (Figure 425).


Figure 425

17) If a press is available, carefully press the complete worm gear assembly from the top of the gearbox out of the bottom of the gearbox (Figure 426).


Figure 426

17a) If no press is available, carefully tap the worm gear assembly with a hammer or brass punch from the top of the base out the bottom of the base as shown in Figure 427.


Figure 427

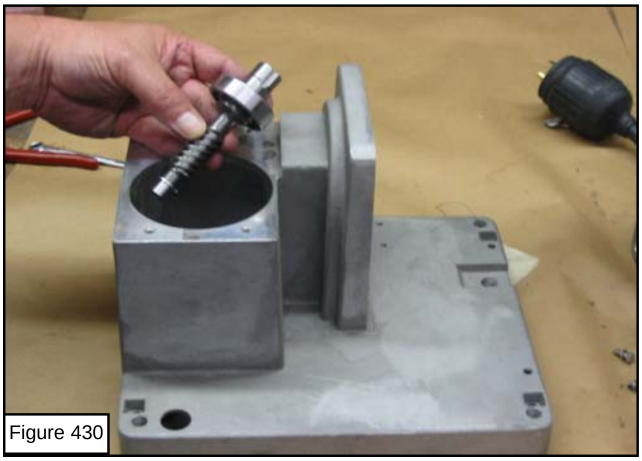
18) Once the worm gear exits the base, the lower bearing {Code #40996, Pos. 16} must be removed (Figure 428).


Figure 428

19) Install the gear puller as shown in Figure 429 and remove the bearing.


Figure 429

20) Remove the steel worm {Code #22397, Pos. 7} through the large gearbox opening as shown in Figure 430.


Figure 430

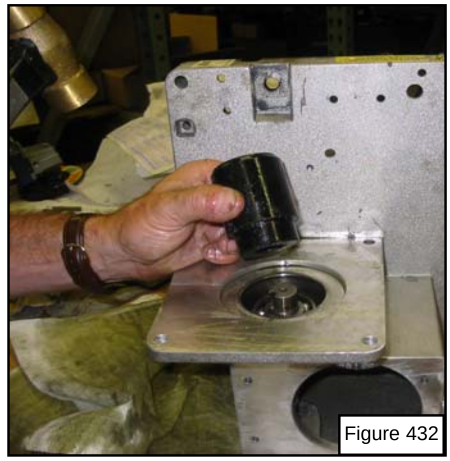
NOTE:
The bearing MUST be replaced in the same orientation. Failure to do so will cause the hoist to malfunction.

21) Inspect the worm gear for wear, damage, or discoloration (Figure 431). Replace if necessary.


Figure 431

4-2) Gearbox Reassembly

1) Install the top bearing {Code #37356, Pos. 20} on the steel worm gear and insert the assembly into the casing. With a brass hammer and punch, press the bearing into the gearbox as shown in Figure 432.


Figure 432

2) Install the bearing {Code #40996, Pos. 16} on the opposite end of the worm shaft as shown in Figure 433.


Figure 433

3) Install the lower snap ring {Code #37796, Pos. 38} as shown in Figure 434 on the next page. Make sure that the snap ring is fitted into the groove.



Figure 434

4) Install the lower cup seal {Code #39376, Pos. 39} as shown in Figure 435.



Figure 435

5) Insert the large brass gear {Code #22387, Pos. 6} into the gear case as shown in Figure 436.

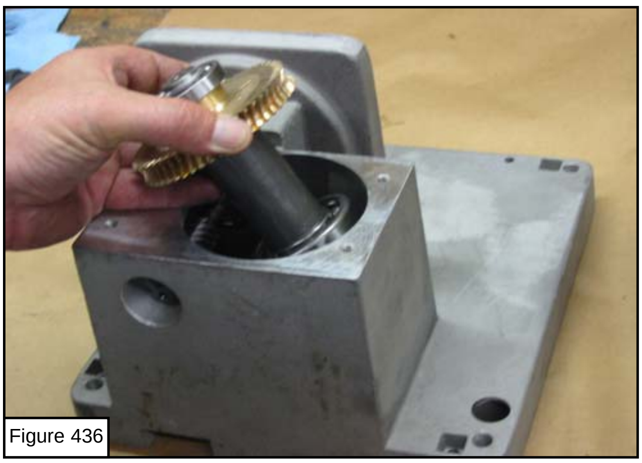


Figure 436

6) With a press or punch, seat the large brass gear {Code #22387, Pos. 6} into the gearbox as shown in Figure 437. Be careful not to damage worm wheel.



Figure 437

7) Install the spacer(s) {Code #25136, Pos. 21} and snap ring {Code #16576, Pos. 22} above the bearing as shown in Figures 438-440. Make sure that the snap ring is fitted into the groove.



Figure 438



Figure 439



Figure 440

8) Take the tool for inserting the top seal {Code #39306, Pos. 23} and place the seal on the tool as shown in Figure 441.


Figure 441

8a) Hammer the seal {Code #39306, Pos. 23} into place as shown in Figure 442.


Figure 442

9) Inspect the O-ring {Code #39286, Pos. 12} and put the cover {Code #40505, Pos. 3} on the gearbox opening as shown in Figure 443 and 444.


Figure 443


Figure 444

10) Tighten the 4 screws {Code #4186, Pos. 69} and lockwashers {Code #16616, Pos. 72} as shown in Figure 445.


Figure 445

11) Refill the gearbox with 1.4 liters of mineral oil per specification.


Figure 446

12) Replace all wire rope drive and motor components. Load test the hoist.

WARNING

Once this procedure has been performed and the complete Tirak reassembled, the Tirak <u>must</u> be load tested to 125% of it's rated capacity (875 lbs.).

Tractel Group
Griphoist Division

4-3 Emergency Controlled Descent Brake XE301P

The controlled descent brake is found between the motor and gearbox. It is sealed and therefore should be clean and not worn. It only functions during intentional use for emergency descent.

4-4 Dissassembly an Checks of Emergency Controlled Descent Brake XE301P

1) Remove the motor from the gearbox by unscrewing the 4 M5x153 threaded bolts {Code #26097, Pos. 12}.

2) Remove the centrifugal brake assembly {Code #39346, Pos. 28}. If it is stuck, you can thread in 2 M6 screws and use them to pull out the brake (See Figure 447).



Figure 447

3) Inspect the brake pocket. The ring should show no wear. There should be no oil, dust, or debris inside. Clean if necessary with brake cleaner (See Figure 448).



Figure 448

4) Remove the O-ring seal {Code #41996, Pos. 27}. Inspect it for damage and replace if flattened or damaged (Figure 449).

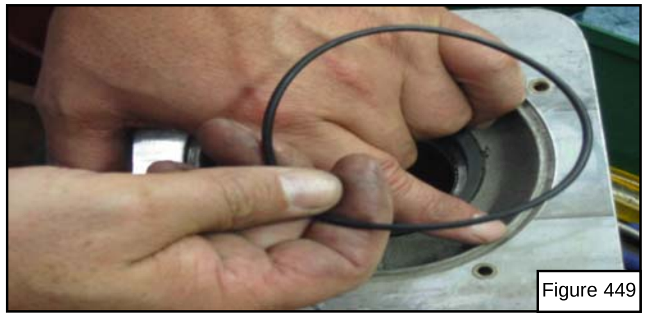


Figure 449

5) Examine the brake assembly. The shoes should not be worn and the springs should be correctly in place (See Figure 450). The lining should be secure.



Figure 450

6) Check that the speed marked on the brake in RPM corresponds to the motor nameplate UPM. 1900 is normal.

4-5 Reassembly of Emergency Controlled Descent Brake XE301P

1) Make sure the snap ring is on the shaft. Insert the key {Code #40986, Pos. 11}. Grease the shaft lightly for ease of brake removal for future inspections (See Figure 448).

2) Insert the brake assembly with the threaded holes upward (See Figure 451). Replace the o-ring.



Figure 451

3) Refit the motor to the gearbox.

4-6 Oil Level Gearbox

WARNING

USE MINERAL OIL ONLY!

Hoist-Position for Oil Level Inspection

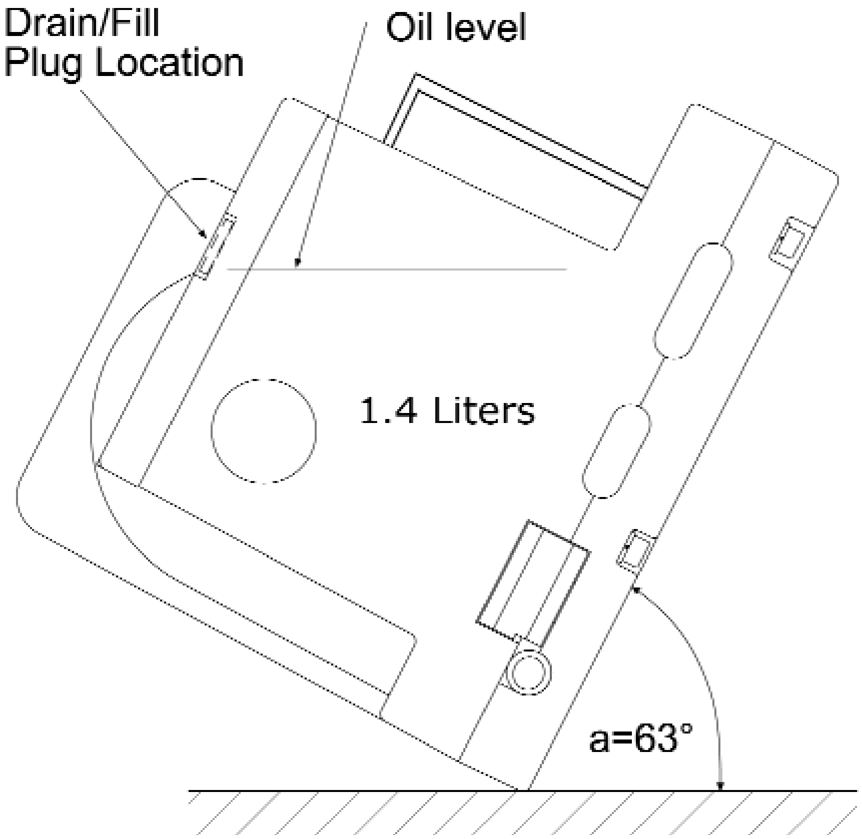


Figure 452

Temperature Range: 14 to 122 °F
-10 to +50 °C

API Specification: SAE85W-140 GL5

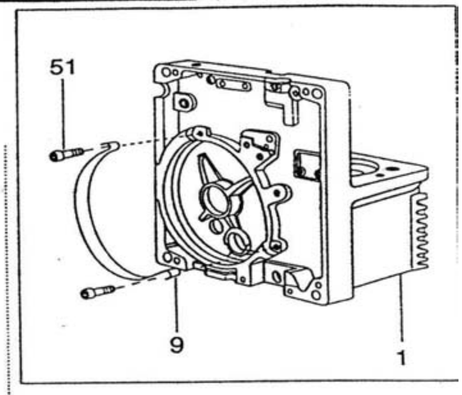
Sample Oils: BP Hypogear EP 90
SHELL Spirax HD 90
TEXACO Multigear EP6 S80 W90

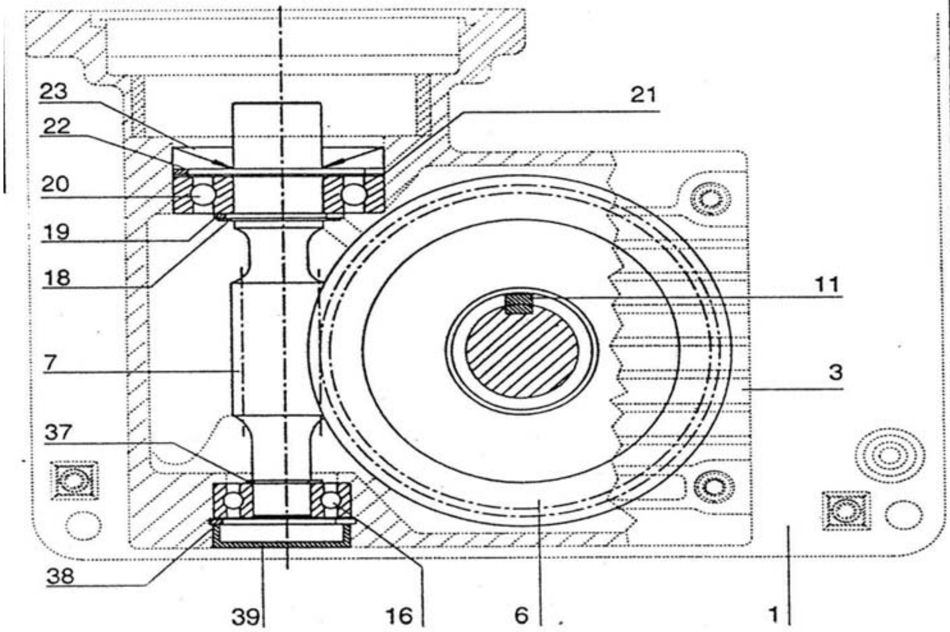
Spare Parts	XE301P - 110V Gearbox	Drawing No Edition Date Page	E-3205 US-1 1/05 2 / 2

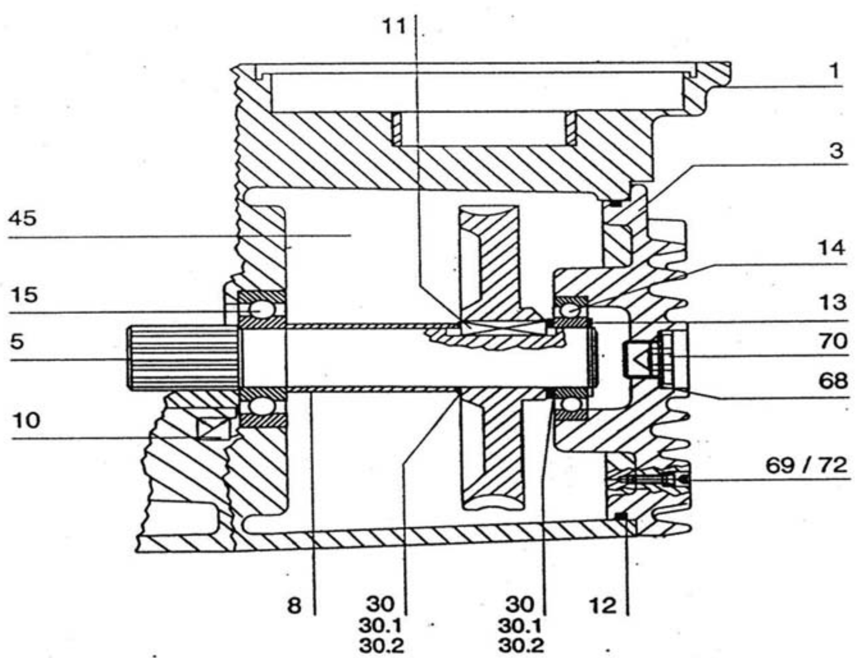
Position	Part #	Qty.	Description	Specifications	List Price
--	42707	1	Casing base with gears X300	for motor size 80	$1,917.80
1	41747	1	Casing base without gears X300	for motor size 80	$586.07
3	40505	1	GEARBOX COVER X300/L500		$63.00
5	22367	1	Shaft pinion		$0.00
6	22387	1	WORM WHEEL		$167.00
7	22397	1	Worm shaft		$0.00
8	40305	1	Distance tube for gearbox	21x30x66	$0.00
9	24187	1	WIRE ROPE GUIDING BAND,COMPLETE F. 8 MM		$25.44
10	39516	1	RADIAL PACKING RING 160/180/10	160x180x10	$32.76
11	40986	1	KEY	6x6x22	$0.35
12	39286	1	O-ring	88x3	$0.00
13	536	1	Snap ring	20x1.2	$0.00
14	25406	1	Ball bearing 16004	20x42x8	$15.88
15	42016	1	Ball bearing 6304	20x52x15	$13.87
16	40996	1	BALL BEARING 6201	12x32x10	$7.27
18	9996	1	Snap ring	25x1.2	$0.39
19	39296	1	Adjusting washer	25x35x1	$0.00
20	37356	1	Ball bearing 6205	25x52x15	$0.00
21	25136	1	Adjusting washer	42x52x1	$0.00
22	16576	1	SNAP RING 52X2 DIN472	52x2	$1.38
23	39306	1	SHAFT SEAL 25/52/7	25x52x7	$9.47
30[1)]	41066	2	ADJUSTING WASHER 20X28X0.5 DIN 988	20x28x0.5	$0.11
30.1[1)]	41046	1	Adjusting washer	20x28x0.1	$0.00
30.2[1)]	41056	2	ADJUSTING WASHER 20X28X0.2 DIN 988	20x28x0.2	$0.11
37	576	1	SNAP RING	12x1	$0.11
38	37796	1	SNAP RING J 32X1.2 DIN 472	32x1.2	$0.18
39	39376	1	CUP SEAL	32x9.5	$9.47
45	21940	1.4	Petroleum gearbox oil (per liter)	80/90W	$0.00
51	4176	2	Socket head cap screw	M6x20	$0.00
68	37646	1	Oil plug screw for petroleum gearboxes	M16x1.5	$3.76
69	4186	4	Socket head cap screw	M6x16	$0.00
70	37656	1	Copper gasket for gearbox oil plug	16x22x1.5 - Cu	$0.39
72	16616	4	SPRING WASHER A6 DIN 127	A6	$0.13

1) To compensate for eventual clearance between distance tube (8) and/or worm wheel (6) and ball bearing (14)

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5) PRIMARY BRAKE FOR MOTOR

⚠ WARNING ⚠

Upon completion of any brake maintenance, it is mandatory that a load test of the hoist be completed!

5.1 Brake Type

All Tirak XE301P hoists are fitted with the adjustable Precima type brake. This section covers the service and repair of this brake only. The XE301P has a 96V or 190V DC brake. Prior to maintenance, verify the brake voltage. This voltage is stamped on the brake nameplate, located on the wiring diagram (Figure 501), on the fan cover (Figure 502), and is stamped on the top of Precima brakes (Figure 503).

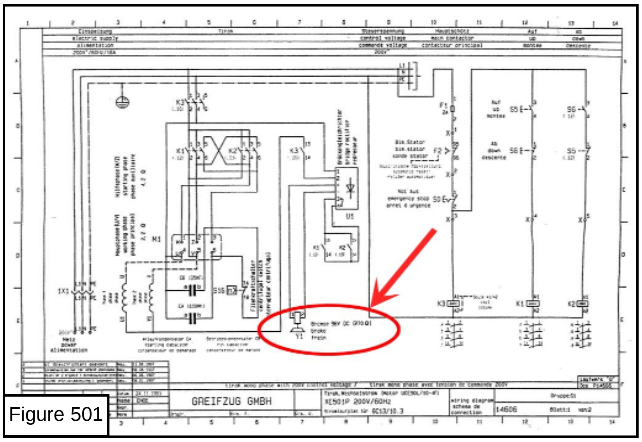


Figure 501



Figure 502

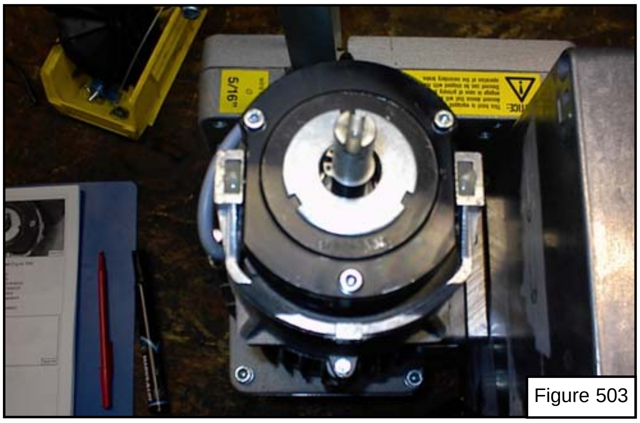


Figure 503

5.2 Tools Required (Figure 504)

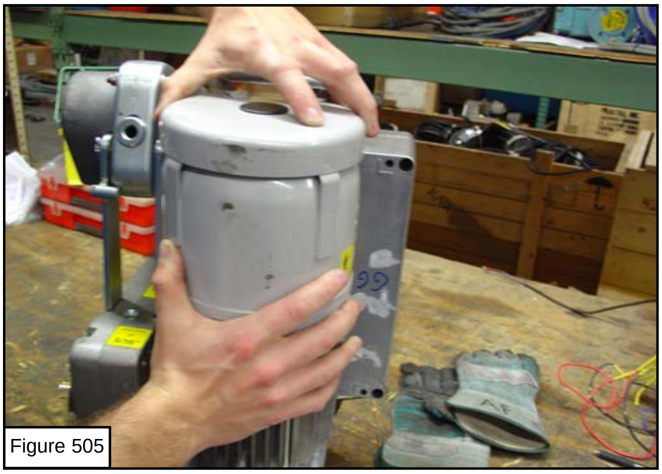
- 5 mm Allen key
- Snap-ring pliers
- 10 mm crescent wrench
- 8 mm crescent wrench
- 2 Flat screwdrivers
- Silicone (RTV) sealant
- Tape
- Calipers (micrometer)
- Feeler gauges

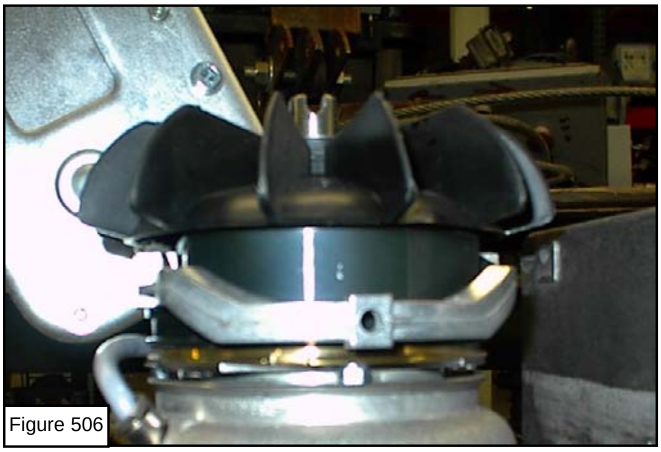


Figure 504

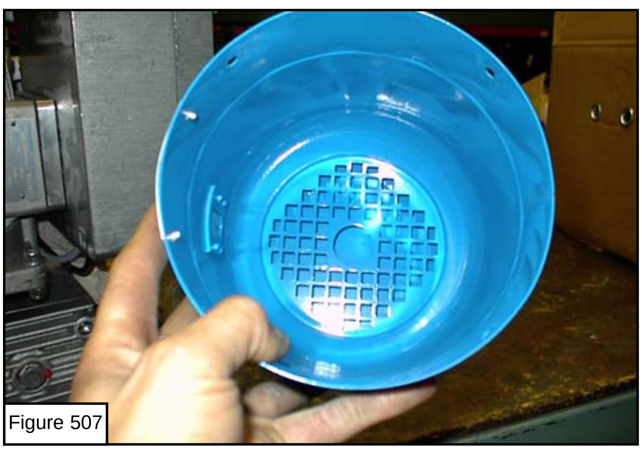
5.3 Brake Inspection

1) Unscrew the 4 screw {Code #16086, Pos 31} and washer assemblies using an 8mm crescent wrench. Remove the fan cover {Code #26607, Pos. 8} as shown in Figure 505 on the next page. If crushed, replace and ensure that the fan spins unobstructed (Figure 506 on the next page).

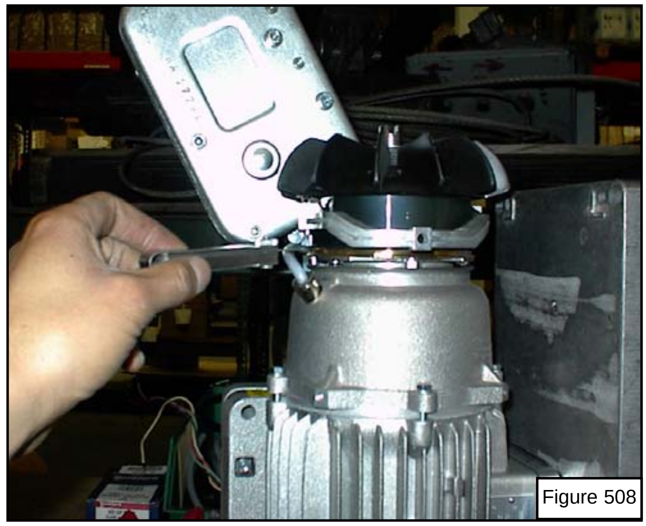

Figure 505


Figure 506

2) Inspect the inside of the fan cover for excessive brake dust (Figure 507). This indicates brake wear caused by an incorrectly adjusted brake or possibly low voltage usage. It may also be an indication of excessive EMERGENCY DESCENT usage.


Figure 507

3) Measure the clearance (a) between the pressure plate and the black brake body with a feeler gauge. This should be done in all three places between the 3 fixing screws every 120 degrees (Figure 508).


Figure 508

4) Measurement of the air gap (a) should be 0.012"(0. 3mm) (Figure 509 and Figure 510). If the air gap (a) needs an adjustment, refer to Section 5.6.

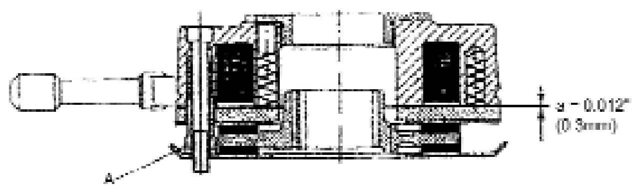


Figure 509

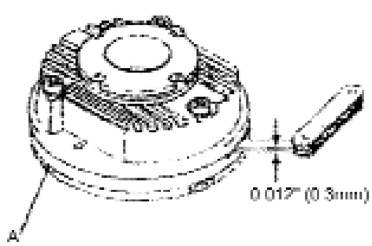
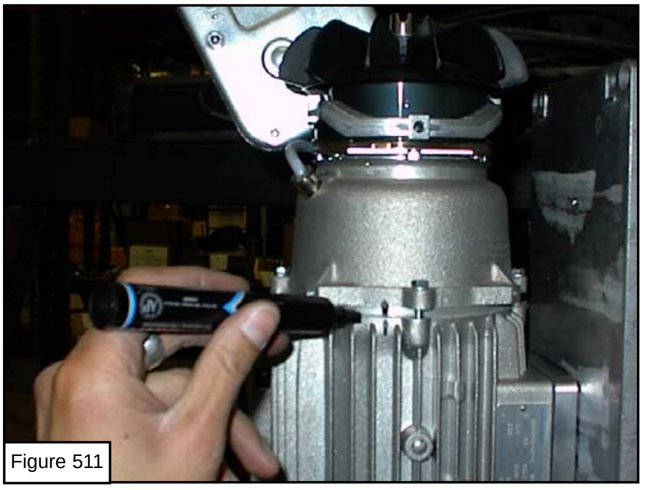


Figure 510

5.4 Brake Removal

NOTE:
Prior to removal, pay attention to the brake orientation and mark it for realignment (Figure 511).


Figure 511

1) Remove the fan snap ring {Code #3866, Pos. 21} shown in Figure 512.


Figure 512

2) Remove the fan {Code #16186, Pos. 7} with two screwdrivers placed under the fan and against the motor shaft and pry upward (Figure 513).


Figure 513

3) If the fan key {Code #16256, Pos. 23} is removable, do so. If not, just wrap some tape around the keyway for safety (Figure 514, 515).


Figure 514


Figure 515

4) Remove the three socket head fixing screws w/ locking washers.

5) Remove the whole brake assembly {Code #49746 (110 V), or #47406 (220 V) Pos. 35} as shown in Figure 516.

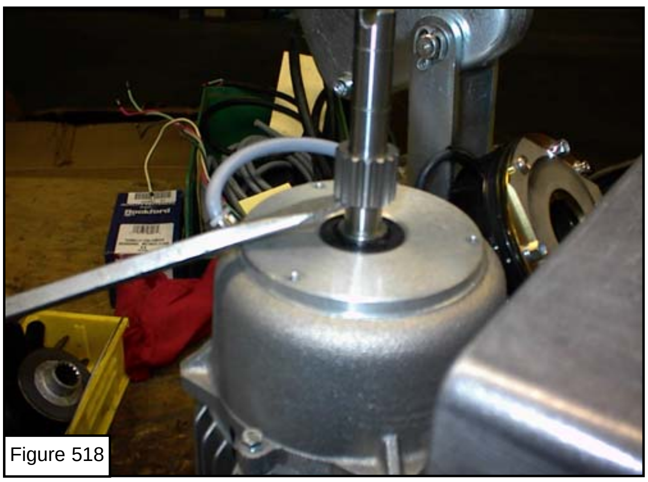

Figure 516

NOTE:
It is not necessary to unwire the brake.

6) Remove the brake rotor {Code #47416, Pos. 38} and inspect it (Refer to Section 5-6). Replace if worn or damaged (Figure 517).

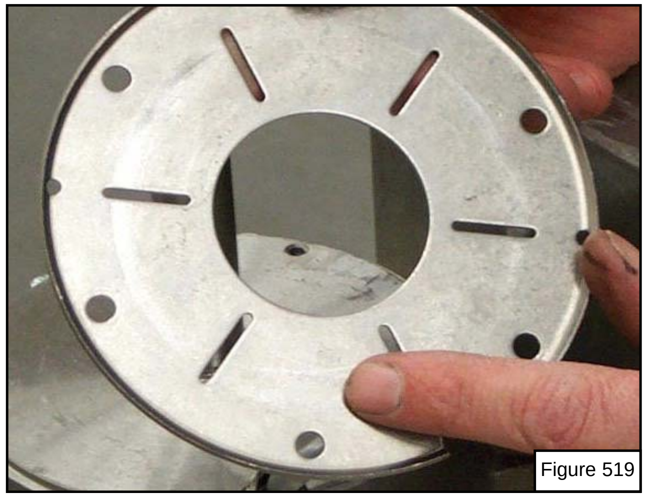

Figure 517

7) Remove the snap ring {Code #3866, Pos. 21} and carefully pry the brake hub {#47426, Pos. 39} and key {Code #16256, Pos. 23} from the motor shaft as shown in Figure 518. Inspect the brake hub and replace if necessary.


Figure 518

NOTE:
Care must be taken when replacing the hub not to damage it.

8) Inspect the friction plate {Code #62026, Pos. 36} for wear (Figure 519). Replace all worn or damaged components.


Figure 519

5.5 Reassembly

NOTE:
Prior to reassembly, it is MANDATORY that the 3 brake end shield holes have silicone applied to seal the screws. This must be done to prevent water entry into the motor (Figure 520).


Figure 520

1) Place the friction plate {Code #62026, Pos. 36} over the motor shaft. Rotate it until the holes of the friction plate are directly over the 3 brake end shield holes.

2) Position the key {Code #16256, Pos. 23} onto the motor shaft and slide the brake hub {Code #47426, Pos. 39} down to the bottom of the shaft. Place the snap ring {Code #3866, Pos. 21} on top of the brake hub to secure it.

3) Slide the brake disc {Code #47416, Pos. 38} down the motor shaft so it fits over the brake hub.

4) Place the whole brake assembly {Code #49746 (110 V), or #47406 (220 V) Pos. 35} (Figure 516) over the motor shaft.

5) Using a 5mm allen wrench, screw the three socket head fixing screws w/ locking washers to hold the brake assembly in place.

6) Postition the fan key {Code #16256, Pos. 23} onto the motor shaft.

7) Align the fan {Code # 16186, Pos. 7} key hole with the fan key {Code #16256, Pos. 23} and press downward.

8) Replace the fan snap ring {Code #3866, Pos. 21} shown in Figure 512.

9) Place the fan cover {Code #68287, Pos. 6} as shown in Figure 511 over the brake. The handle should face in the direction of the control box.

10) Install the 4 screw {Code #16086, Pos 31} and washer assemblies using an 8mm wrench.

5-6 Disc Inspection

A new brake disc has a thickness of 5 mm, which is indicated on the top of the brake. If excessive brake wear is apparent or the air gap is significantly greater than 0.012" (0.3mm), measure the brake disc with a caliper. See Figure 521.

Maximum brake wear is 0.040" [1mm] - If disc thickness is less than 4 mm, the brake disc must be replaced.

Model	Brake Size	New Disc Thickness
XE 301P - 110V	FDB 10 / 96V (#49746)	5 mm
XE 301P - 220V	FDB 10 / 190V (#47406)	5 mm



Figure 521

5-7 Brake Air Gap Adjustment

If adjustment is required proceed as follows.

The air gap should be 0.012" [0.3mm]. If necessary, adjust by means of the three set screws and counter nuts as follows:

1) Loosen the three socket head fixing screws a few turns as shown in Figure 522.

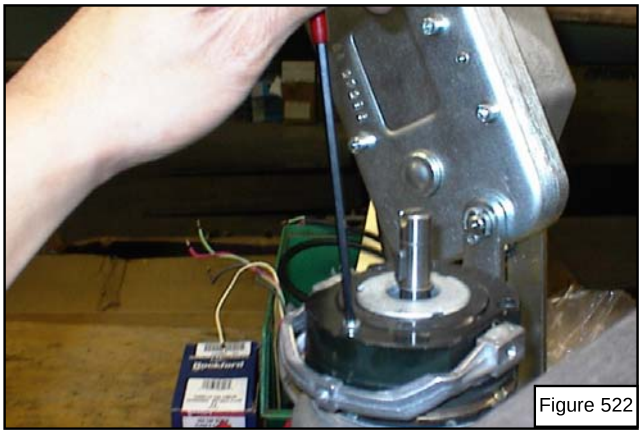


Figure 522

2) Adjust each of the three 8mm adjustment screws (Figure 523) AN EQUAL # OF DEGREES to either increase or decrease the air gap (a) to 0.012" [0.3mm]. Unbalanced adjustments will lead to excessive brake wear.

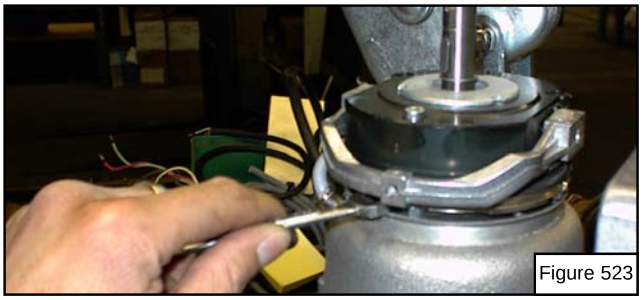


Figure 523

3) Tighten down the three socket head fixing screws w/locking washers.

4) Measure the air gap as shown in Figure 524. If necessary, repeat steps 1-3 until an air gap of 0.012" (0.3mm) is achieved.

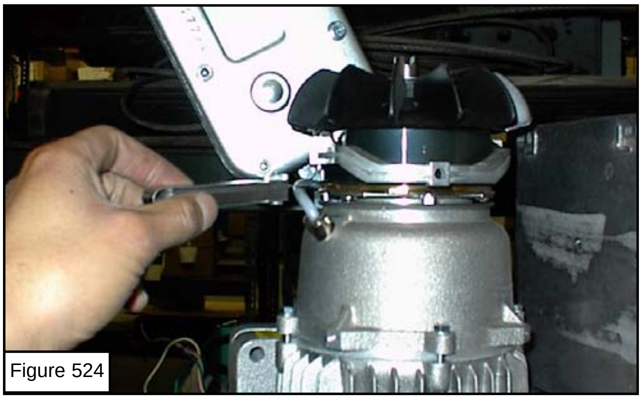


Figure 524

5) Remove each of the three socket head fixing screws separately and apply a bead of silicone (Figure 525) to the tip to prevent water entry into the motor. Replace all three screws.

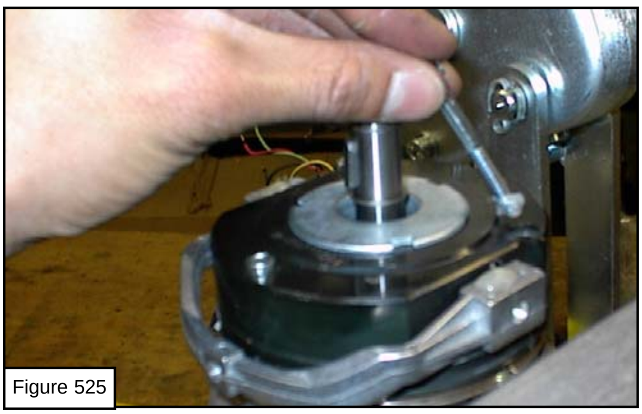


Figure 525

NOTE:
The adjustment of the gap on the brake release stirrup has NOTHING TO DO with the adjustment of the air gap of the brake!

5-8 Release Strirrup Replacement

1) Carefully remove all sealant (Figure 526) if the brake release stirrup is to be replaced.

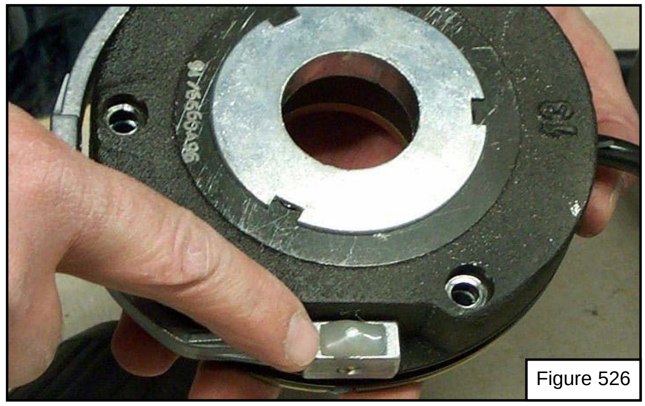


Figure 526

2) Use a C-clamp to hold the brake assembly together as shown in Figure 527.

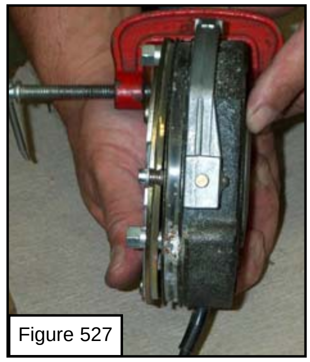


Figure 527

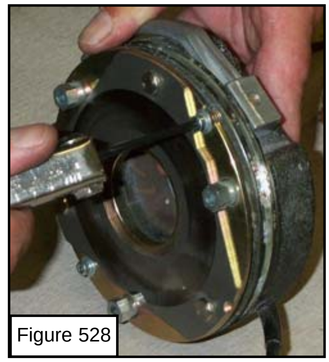


Figure 528

3) Unscrew the two fixing screws as shown in Figure 528 (“E” in Figure 530 on next page).

4) Install the new brake release stirrup (B) {Code #61716, Pos. 40}.

5) Install the new fixing screws (Figure 529).

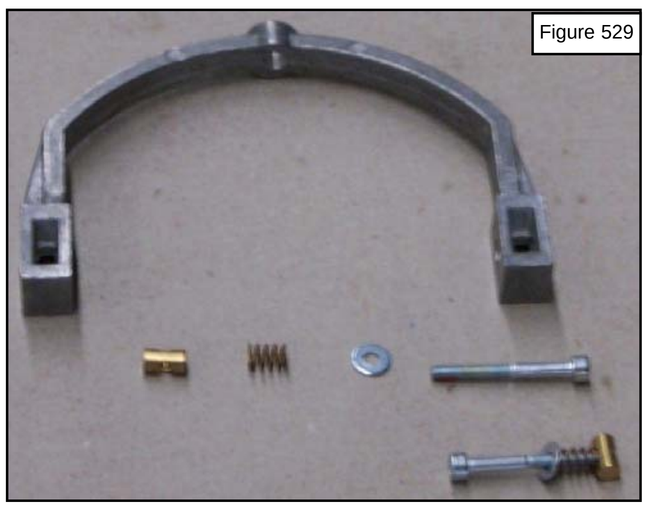


Figure 529

6) Install the brake onto the motor. Apply silicone to the brake end shield holes prior to installation to prevent water from entering the motor. Replace all three screws.

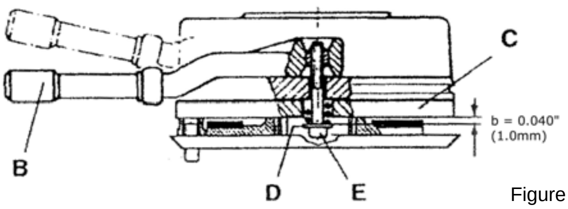


Figure 530

7) Measure distance (b) between the brake retraction plate (C) and washer (D) in Figure 530. This distance must be 0.039" (1mm). If necessary, adjust symmetrically on both sides by means of the two screws (E).

5-9 Operational Check

Testing must be carried out once the brake has been completely reassembled. With the fan cover removed, proceed with the operational check:

1) With the correct power supplied to the hoist, push the up or down button.

2) Visually inspect that the anchor disc (“C” in Figure 530) lifts evenly upward away from the brake disc. A pronounced "click" or "snap" should be heard when it retracts magnetically.

3) CAREFULLY feel for heat (Figure 531) around the entire electromagnetic brake being cautious around the rotating fan.


Figure 531

4) If there is any heat being generated, re-inspect the brake air gap because the disc is most likely dragging.

5) If no heat is generated, reinstall the fan cover. When installing the fan cover, pull back as shown in Figure 532 to gain more clearance for the emergency descent lever.


Figure 532

5-10 Coil Resistance Inspection

Measure the resistance of the brake coil as shown in the Electrical Control Box chapter.

XE301P brake resistances listed in table 501.

Brake coil resistance is also found on the wiring diagram.

WARNING

Upon completion of any brake maintenance, it is MANDATORY that a load test of the hoist be completed.

5-11 Parts List Primary Brake

Brake Type	Code Complete	Disc Code	Release Code	Hub Code
110 V Precima Model FDB10 Resistance 332 Ohms	49746	47416	61716	47416
220 V Precima Model FDB10 Resistance 1430 Ohms	47406	47416	61716	47416

Table 501

5-12 Modification Comment

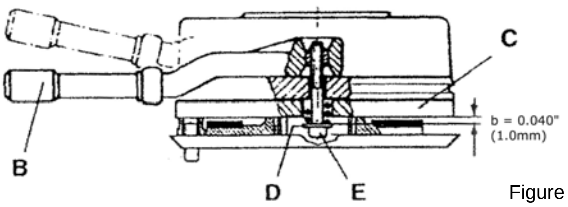


Figure 530

Subject : Adjusting of the brake release lever.

Reason : Simplify assembly and inspection

The former instructions regarding the adjustment of the distance “b” (Figure 530) for the brake release lever “B” in (Figure 530) “with the brake opened” were based on an internal production instructions of the manufacturer by means of a special tool.

After discussion with the manufacturer the procedure can be simplified by checking the distance “b” (Figure 530) “with the brake closed”; in consequence the manufacturer’s value of 0.039” [1mm] must be reduced by the air gap (a) 0.012” [0.3mm], which gives the new checking dimension of 0.028” [0.7mm].

5-13 Assembly and Adjusting

Fix the new brake to the motor and connect it into the control box.

Check the air gap (a) = 0.012” [0.3mm] around the brake with a feeler gauge - if necessary, adjust by means of set screws “A” (See Section 5-3).

When assembling a new brake check adjustment of brake release lever “B” (See Section 5-7).

With the brake closed the distance (b) between anchor disk “C” and washers “D” must be 0.028” [0.7mm]. If necessary, adjust symmetrically on both sides by means of screws “E”.

WARNING

The adjustment of the brake release lever must not be changed afterwards, even in case of an air gap (a) readjustment, as security is adversely affected.

6) MOTOR

6-1 Replacement of Motor Winding (Stator)

NOTE:
The motor and control box must be removed before attempting to replace the motor winding (stator).

1) Remove the fan cover M5x10 hex screws {Code #16086, Pos. 31} as shown in Figure 601.

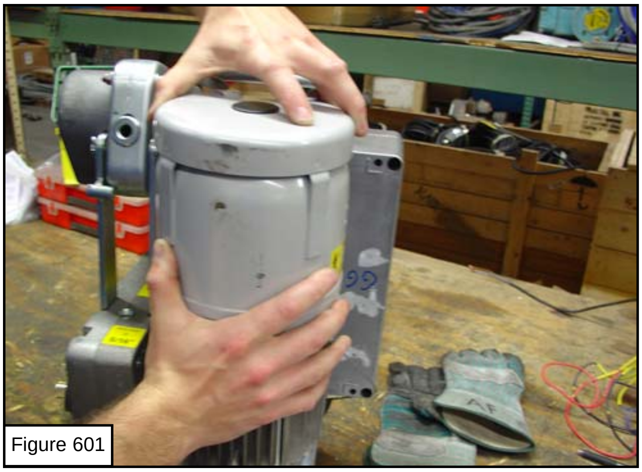


Figure 601

2) Remove the fan snap ring {Code #3866, Pos. 21} shown in Figure 602.

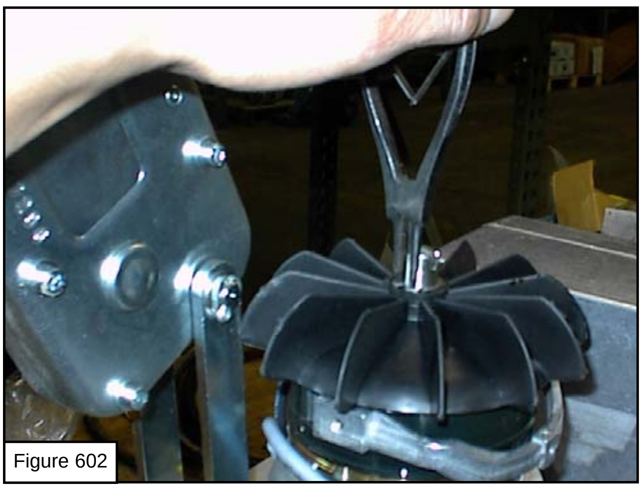


Figure 602

3) Remove the fan {Code #16186, Pos. 7} using two screwdrivers. Placed them under the fan and against the motor shaft. Pry upward. (Figure 603).



Figure 603

4) Remove the whole brake assembly {Code #49746 (110 V), or #47406 (220 V) Pos. 35} by removing the three socket head fixing screws w/locking washers. (Figure 604).

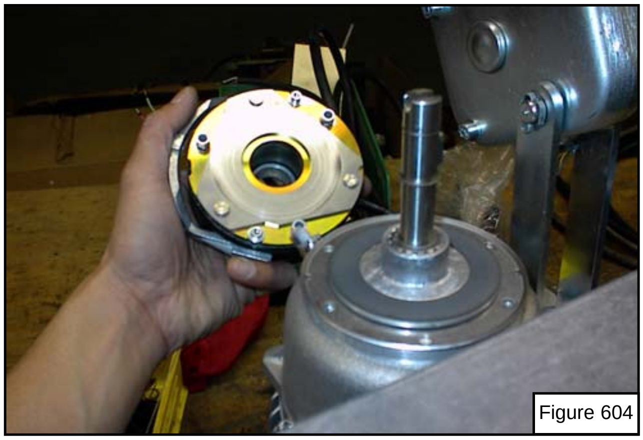


Figure 604

5) Remove the brake disc {Code #47416, Pos. 38} and the brake hub {Code #47426, Pos. 39}. Remove the snap ring {Code #536, Pos. 20} and carefully pry the hub from the motor shaft as shown in Figure 605.



Figure 605

6) Remove the friction plate {Code #62026, Pos. 36} shown in Figure 606.

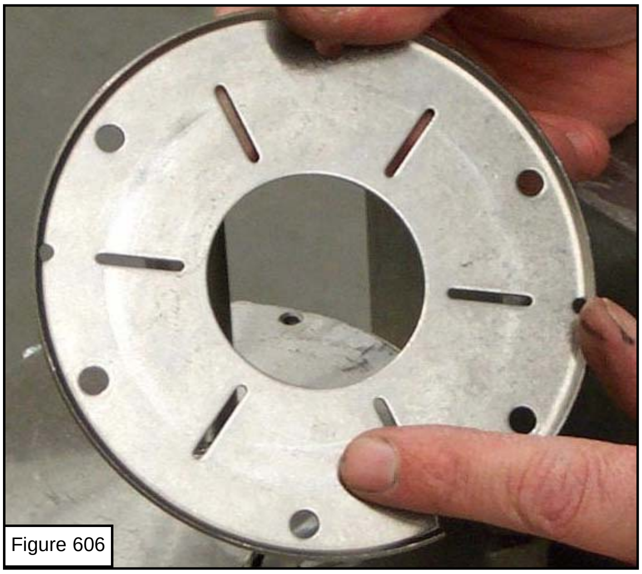


Figure 606

7) Remove the four M5x153 mm hex head screws {Code #26097, Pos. 12} holding onto brake flange shown in Figure 607.



Figure 607

NOTE:
Prior to removal, pay attention to the brake orientation and mark it for realignment (Figure 608).



Figure 608



Figure 609

8) Using a rubber mallet, drive out the motor shaft {Code #26587, Pos. 15} as shown in Figures 609 and 610.



Figure 610

9) Remove the ring terminal winding wires (black-w, red-z, red-u and black-v) as shown in Figure 611.

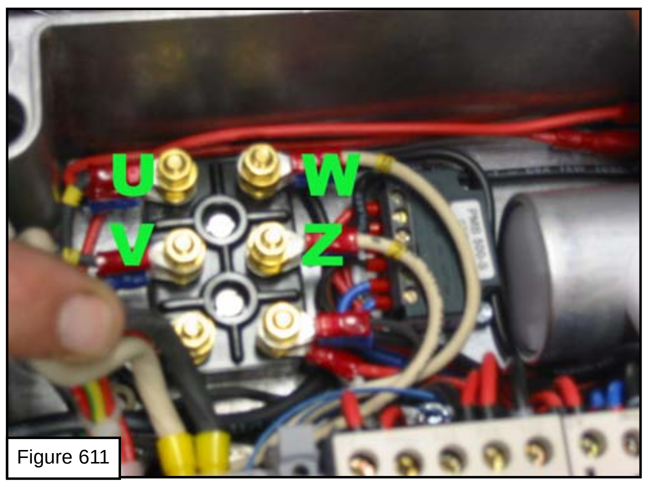


Figure 611

10) Remove the small thermal protector wires from grey X1 and X2 (Figure 612).

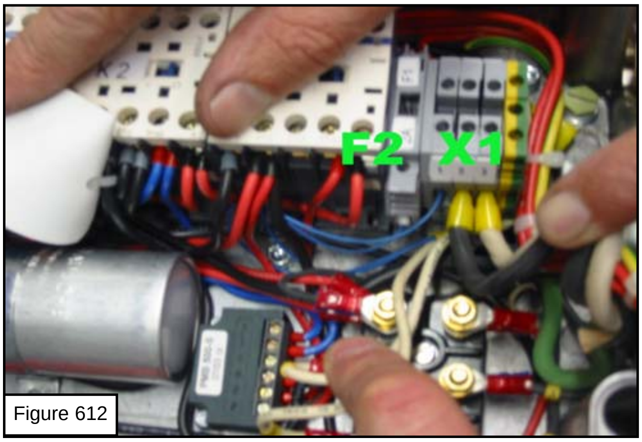
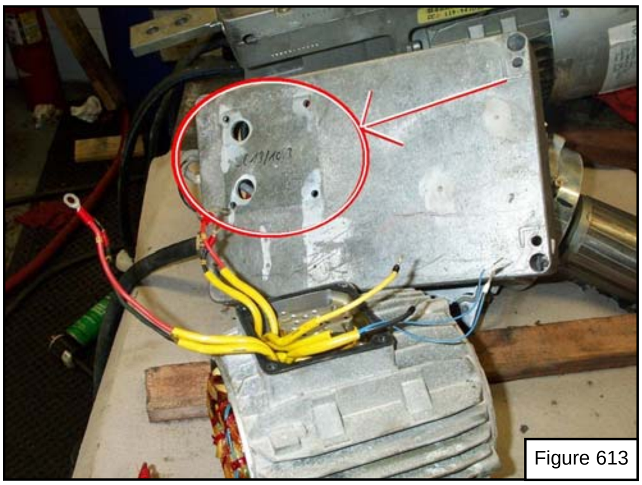
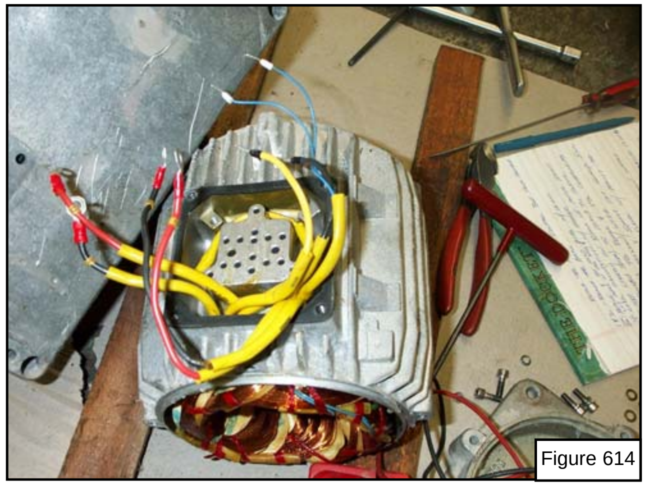


Figure 612

11) Remove the four socket head cap screws and lock washers that are holding the control box to the motor. Remove the control box (Figure 613).


Figure 613

12) Replace the old winding with a new winding as shown in Figure 614.


Figure 614

6-2 Centrifugal Switch Replacement XE301P

1) Remove the motor and control box from the hoist (See Figure 615 on the next page). Remove the fan cover 4x8mm hex head screws {Code #16086, Pos. 31}.

WARNING

Discharge the start and run capacitors before proceeding.



Figure 615

2) Remove the fan snap ring {Code # 3866, Pos. 21, Figure 616} and pry off the fan {Code #16186, Pos. 7} using 2 screwdrivers (See Figure 617). Make sure the screwdrivers are against the motor shaft when prying.

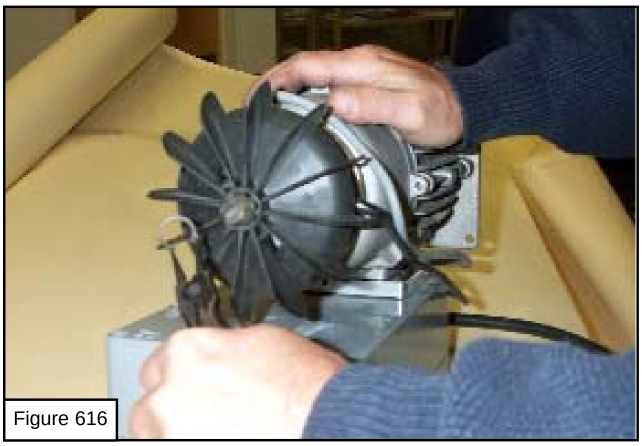


Figure 616

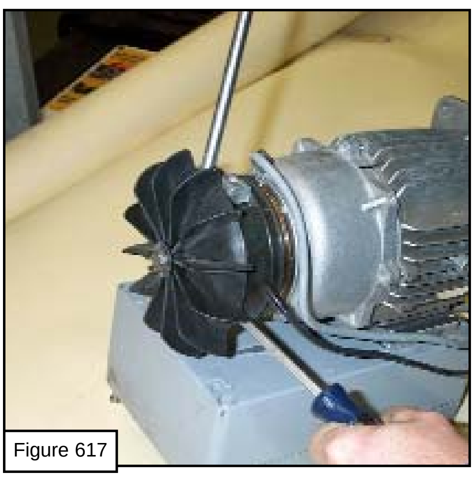


Figure 617

3) Take off the primary brake {Code #49746 (110 V), or #47406 (220 V) Pos. 35} by removing the 3 socket head cap screws (See Figure 618).



Figure 618

4) Remove the brake disc {Code #47416, Pos. 38}, friction disc {Code #62026, Pos. 36}, snap ring {Code #3866, Pos. 21}, hub {Code #47426, Pos. 39} and key {Code #16256, Pos. 23} shown in Figure 619.



Figure 619

5) Remove the 4 M5X153 threaded bolts {Code #26097, Pos. 12} that hold the cast aluminum brake end bell housing to the motor (See Figure 620).



Figure 620

6) Mark the position of the white centrifugal switch for easy alignment during reassembly as shown in Figure 621.



Figure 621

7) Loosen the 2 screws holding the centrifugal switch wires and remove the 2 spade connectors from beneath the screws (See Figures 622 and 623).



Figure 622



Figure 623

8) Unscrew the 3 M4x16 screws {Code #16996, Pos. 30} holding the centrifugal switch (See Figure 624).



Figure 624

9) Mark the flange for reassembly (See Figure 625).



Figure 625

10) With a rubber mallet, tap the cast aluminum brake end bell {Code #26107, Pos. 5, Figure 626}.



Figure 626

11) Remove the motor shaft assembly {Code #26587, Pos. 15, Figure 627}.



Figure 627

12) Loosen the set of screws holding the mechanical part of the centrifugal switch (See Figure 628) and push the assembly away from the ball bearing to allow room for a puller (See Figure Figure 629).



Figure 628

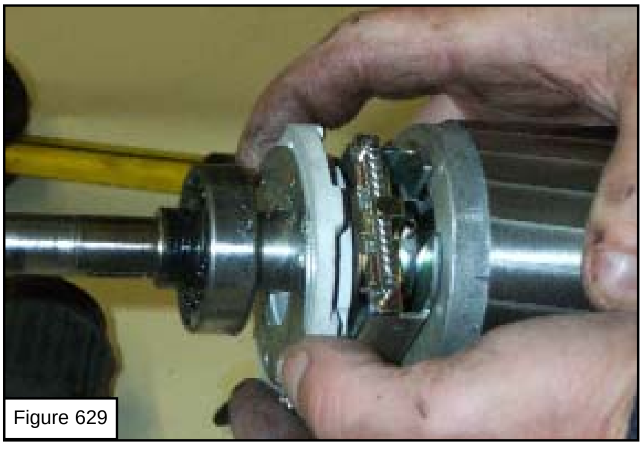


Figure 629

13) Remove the ball bearing 6004-RS1 {Code #16536, Pos. 18} by removing the snap ring {Code #536, Pos. 20, Figure 630} and pulling with a bearing puller (See Figures 631 and 632).



Figure 630



Figure 631



Figure 632

14) Remove the bearing. Notice that one side is sealed and the other side is not (See Figure 633).



Figure 633

15) Remove the snap ring {Code #536, Pos. 20} in Figure 634.



Figure 634

16) Remove the bearing cover {Code #27935, Pos. 6} in Figure 635.



Figure 635

17) Remove the white centrifugal switch and mechanical actuating mechanism (See Figure 636 and 637).



Figure 636



Figure 637

NOTE
We suggest you layout the parts on the workbench for ease of reassembly (See Figure 638).



Figure 638

18) Check the centrifugal switch contacts for burn, malfunction, etc. Manipulate the switch to see if the contacts open and close (See Figure 639).

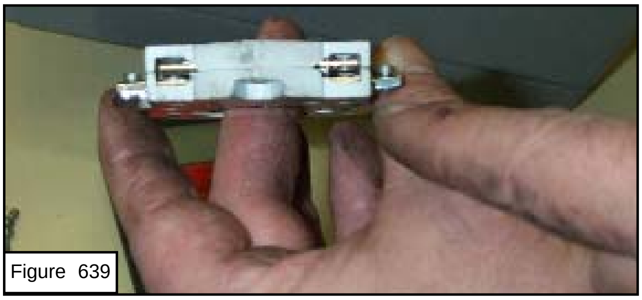


Figure 639

NOTE
Sometimes contact cleaner and emery cloth can repair a malfunctioning switch (See Figure 640).



Figure 640

19) Before installation of a new switch, check that it functions properly with a meter. Open and close the switch. The meter should indicate open (Figure 641) and closed (Figure 642) when manipulated on the bench.



Figure 641



Figure 642

19a) If it stays open, clean the contacts with contact cleaner and emery cloth (See Figure 643 and 644).



Figure 643



Figure 644

20) Reassemble the new mechanical and electrical switch on the motor shaft (See Figure 645).



Figure 645

21) Replace the bearing cover {Code #27935, Pos. 6, Figure 637} and reaffix the snap ring {Code #536, Pos. 20, Figure 636}. Repack the ball bearing with grease. Note that the seal is on the bottom and the bearing is open to the top (See Figure 646).


Figure 646

22) With a metal tube (Figure 647) tap the bearing onto the shaft until it contacts the snap ring below it (See Figure 618).


Figure 647



Figure 648

23) Replace the snap ring {Code #536, Pos 20} on the shaft (See Figure 630).

Sqeeze the mechanical portion of the centrifugal switch while sliding it up the shaft (See Figure 651). With the set screw lock it into position on the shaft (See Figure 628).

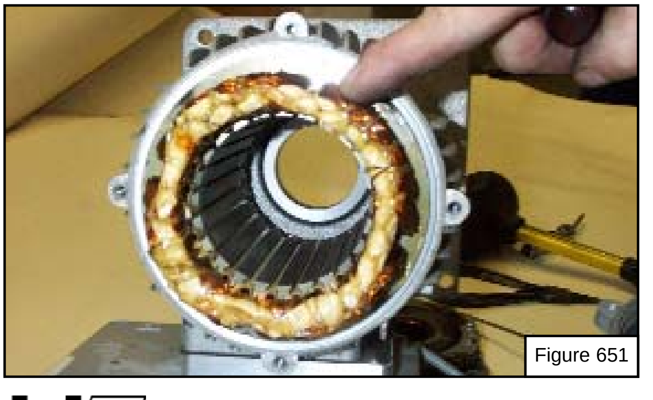
23) Manipulate the new switch to see if it opens and closes properly (See Figure 649).


Figure 649

24) Reattach the wires to the switch (Figure 650).


Figure 650

25) Check the winding for burns or damage (See Figure 651).


Figure 651

26) Put the cast aluminum brake end shield on the motor shaft (See Figure 652).


Figure 652

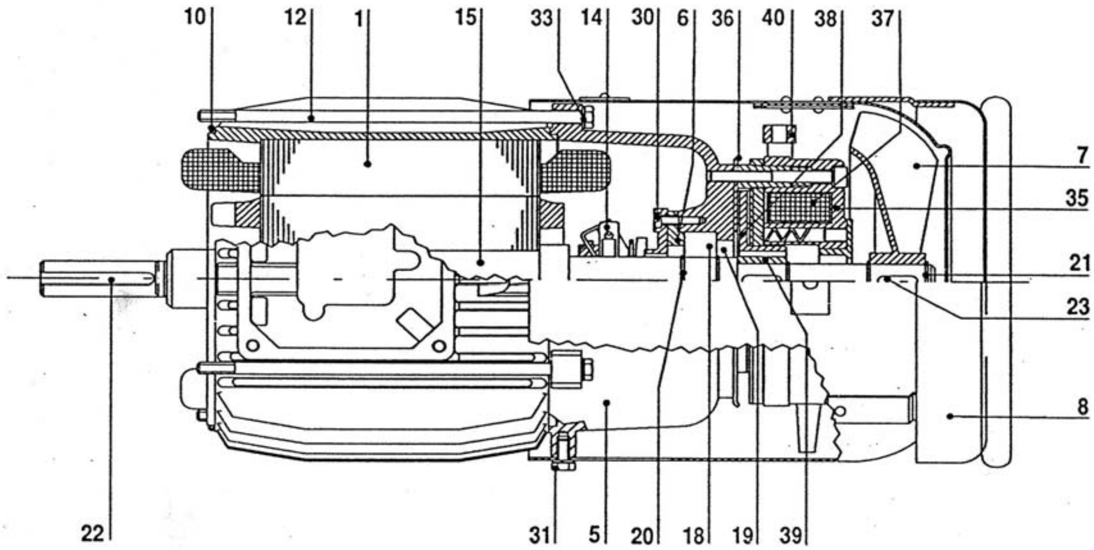
27) Realign the switch and retighten the 3 M4x16 screws {Code #16996, Pos. 30, Figure 629}. Place silicone around the bottom of the cast aluminum end shield to seal the joint between the winding and shield.

28) Place the motor shaft assembly into the winding, align the marks and tighten the 4 M5x153 {Code #26097, Pos. 12} bolts.

29) Reassemble the brake per Section 5-12.

30) Replace the fan cover. Refit the motor and test.

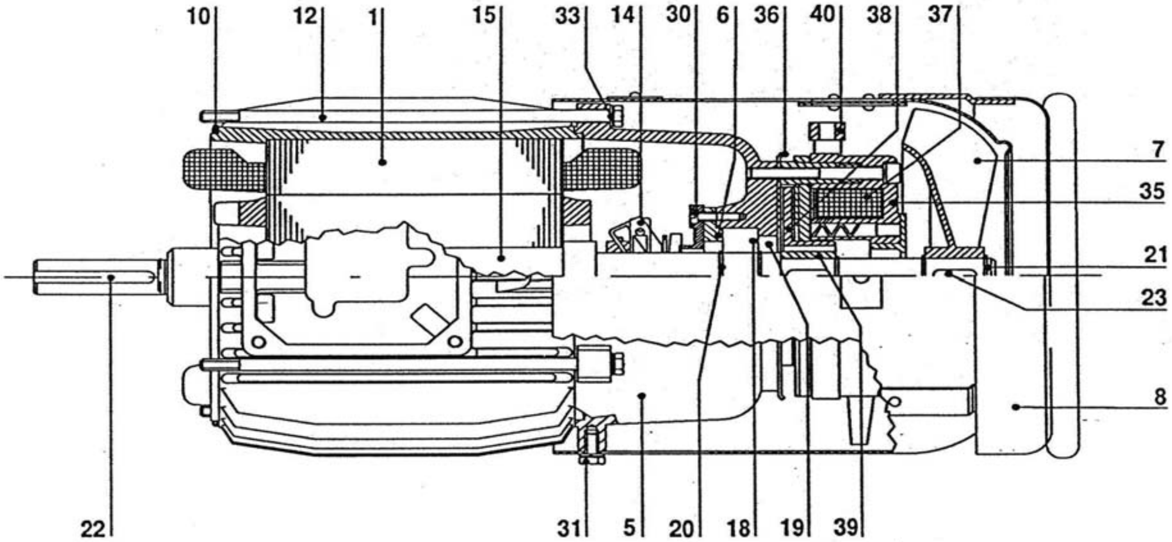
Spare Parts	**XE301P - 110V** **110V / 1ph. 0.55 kW / 60Hz** **Motor type: UBE 80/11-4F-100V**	Drawing No Edition Date Page	E - 3075 US-1 1/05 1 / 1



Position	Part #	Qty.	Description	Specifications	List Price
-	15648	1	Motor complete UBE80/11-4F, XE301	0.55kW, 110V	$1,550.68
1	26597	1	Stator for UBE80/11-4F, XE301	0.55kW, 110V	$496.57
5	26107	1	BRAKE END SHIELD	Sz. 80	$140.58
6	27935	1	BEARING COVER		$47.07
7	16186	1	Fan for Motor		$7.14
8	26607	1	FAN COVER XE301p	Sz. 80	$125.03
(8a*)	47837	1	Replacement rain cover w/ handle	Size 80	$0.00
(8b*)	69536	1	Plastic cap for fan cover with hole		$0.00
10	41996	1	O-RING FOR MOTOR SIZE 80 120 X 2,5	120x2.5	$4.77
12	26097	4	THREADED BOLT C/W NUT	M5x153	$4.62
14	15796	1	CENTRIFUGAL SWITCH XE301P, LE501P	2 pieces incl.	$72.61
15	26587	1	MOTOR SHAFT WITH ROTOR		$258.95
18	16536	1	Ball bearing 6004-RS1	20x42x12	$12.12
19	26376	1	SHAFT SEAL DIA.20/35/7 BASL	20x35x7	$4.16
20	536	2	Snap ring	20x1.2	$0.00
21	3866	3	Snap ring	15x1	$0.00
22	39316	1	KEY A 5X5X45 DIN 6885	5x5x45	$0.39
23	16256	2	Key	A5x5x16	$0.26
(25*)	16206	1	Motor nameplate	Metal	$1.90
(26*)	16236	2	RIVET 2 X 6 DIN 1476	2x6	$0.13
(27*)	16706	1	Brake nameplate	Metal	$2.26
(28*)	3776	2	Blind rivet	2.4x6	$0.00
30	16996	3	Cheese head screw	M4x16	$0.00
31	16086	4	HEXAGONAL SCREW M5X10 DIN933	M5x10	$0.13
33	16246	8	SPRING WASHER DIA.5 DIN 127	A5	$0.13
35	49746	1	Electromagnetic brake complete	FDB 10 / 96V	$0.00
36	62026	1	FRICTION PLATE FDB10	FDB 10	$17.33
37	62446	1	Brake coil assembly	FDB 10 / 96V	$0.00
38	47416	1	BRAKE ROTOR FDB 10	FDB 10	$75.82
39	47426	1	BRAKE HUB SIZE FDB10	FDB 10	$61.49
40	61716	1	BRAKE RELEASE STIRRUP CPL. FDB 10	FDB 10	$97.20

*) not shown

Spare Parts	XE301P - 220V/1ph. 220V / 1ph. 0.55 kW / 60Hz Motor type: UBE 80/11-4F-200V	Drawing No Edition Date Page	E - 3076 US-1 1/05 1 / 1



Position	Part #	Qty.	Description	Specifications	List Price
-	15638	1	Motor complete UBE80/11-4F, XE301	0.55kW, 220V/1ph.	$1,535.51
1	26577	1	Stator for UBE80/11-4F, XE301	0.55kW, 220V/1ph.	$495.60
5	26107	1	BRAKE END SHIELD	Sz. 80	$140.58
6	27935	1	BEARING COVER		$47.07
7	16186	1	Fan for Motor		$7.14
8	26607	1	FAN COVER XE301p	Sz. 80	$125.03
(8a*)	47847	1	Replacement rain cover w/ handle	Size 90	$77.17
(8b*)	69536	1	Plastic cap for fan cover with hole		$0.00
10	41996	1	O-RING FOR MOTOR SIZE 80 120 X 2,5	120x2.5	$4.77
12	26097	4	THREADED BOLT C/W NUT	M5x153	$4.62
14	15796	1	CENTRIFUGAL SWITCH XE301P, LE501P	2 pieces incl.	$72.61
15	26587	1	MOTOR SHAFT WITH ROTOR		$258.95
18	16536	1	Ball bearing 6004-RS1	20x42x12	$12.12
19	26376	1	SHAFT SEAL DIA.20/35/7 BASL	20x35x7	$4.16
20	536	2	Snap ring	20x1.2	$0.00
21	3866	3	Snap ring	15x1	$0.00
22	39316	1	KEY A 5X5X45 DIN 6885	5x5x45	$0.39
23	16256	2	Key	A5x5x16	$0.26
(25*)	16206	1	Motor nameplate	Metal	$1.90
(26*)	16236	2	RIVET 2 X 6 DIN 1476	2x6	$0.13
(27*)	16706	1	Brake nameplate	Metal	$2.26
(28*)	3776	2	Blind rivet	2.4x6	$0.00
30	16996	3	Cheese head screw	M4x16	$0.00
31	16086	4	HEXAGONAL SCREW M5X10 DIN933	M5x10	$0.13
33	16246	8	SPRING WASHER DIA.5 DIN 127	A5	$0.13
35	47406	1	ELECTROMAGNETIC BRAKE CPL. FDB 10 190V	FDB 10 / 190V	$207.51
36	62026	1	FRICTION PLATE FDB10	FDB 10	$17.33
37	62016	1	BRAKE COIL ASSY. FDB 10/190V	FDB 10 / 190V	$125.00
38	47416	1	BRAKE ROTOR FDB 10	FDB 10	$75.82
39	47426	1	BRAKE HUB SIZE FDB10	FDB 10	$61.49
40	61716	1	BRAKE RELEASE STIRRUP CPL. FDB 10	FDB 10	$97.20

*) not shown

7) CONTROL BOX XE301P

NOTE:
All of the following checks are done without power to the motor or hoist.

7-1 Tools Required

- Volt/Ohm meter (left in Figure 701)
- Digital Capacitor meter (up to 275uF)
- 2 insulated screwdrivers



Figure 701

7-2 Control Box Cover Inspection

1) Check that all labels are legible and in the right place (Figure 702). If not, replace those labels. See sec. 9-2 for correct location and code.



Figure 702

2) Check that the emergency stop button functions normally. (Figure 703). Press it to lock in the "Off" position. Twist it to check that it springs open into the "On" position. Check that it is not loose. If it is, open the cover and tighten the 2 screws that hold it in place.



Figure 703

3) Check that the protective cover around the emergency stop button is in good condition and is not loose. Replace it if necessary. The 3 screws must be tightened and have silicone applied to seal against water entry.

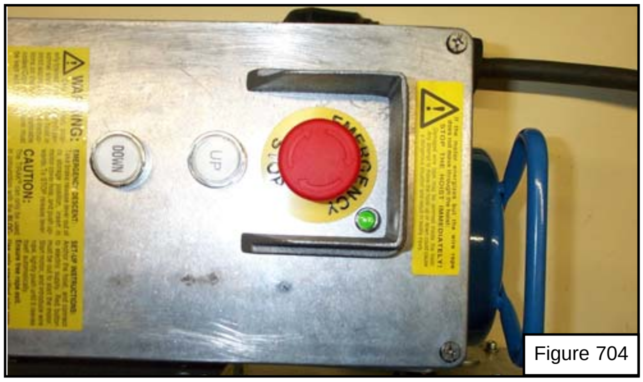


Figure 704

4) Check that the voltage indicator light is not damaged (Figure 704).

7-3 Ground (Cord/Plug) Check

1) With an ohm meter, check each prong to the case of the TIRAK. The long ground prong should show continuity (Figure 705).



Figure 705

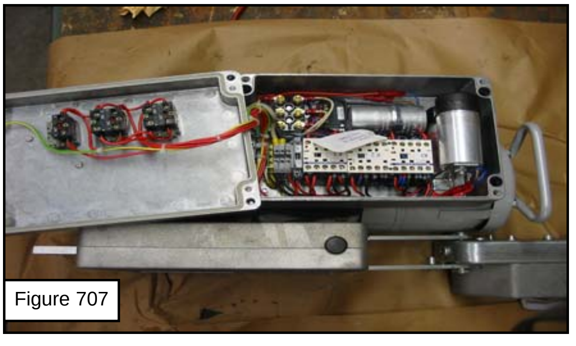
The two shorter prongs should not show continuity (Figure 706).


Figure 706

NOTE:
If either of the shorter prongs show continuity to ground, a short circuit has occurred and must be fixed. It is possible that the plug is wired incorrectly or the insulation is cut. Open the plug and investigate. Also check the cord grip.

7-4 Wiring Diagram Location

1) Using a screwdriver, open the control box (Figure 707).

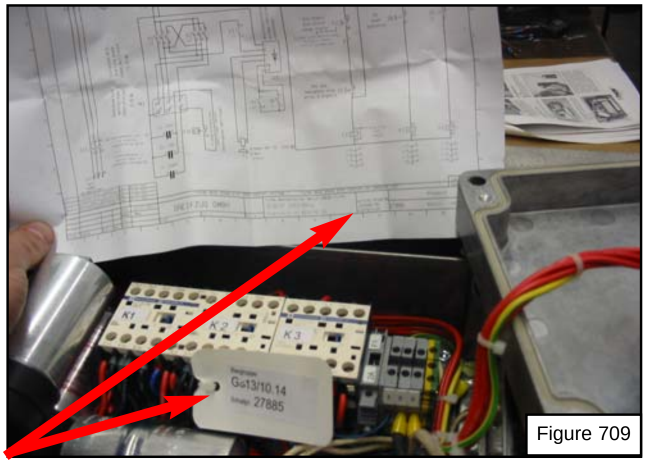

Figure 707

2) A tag tied to wires indicates the control box type, L10.3B, and wiring diagram, #34427 (Figure 708).



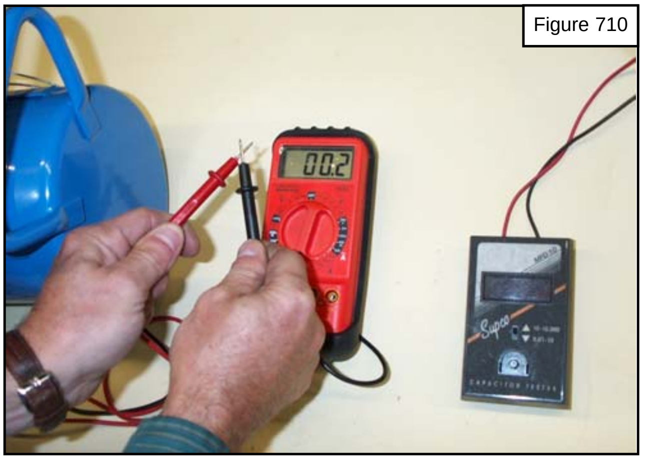
Figure 708

3) A full size diagram should be folded and tucked in place next to the relays. Check that the full size diagram matches the tag (Figure


Figure 709

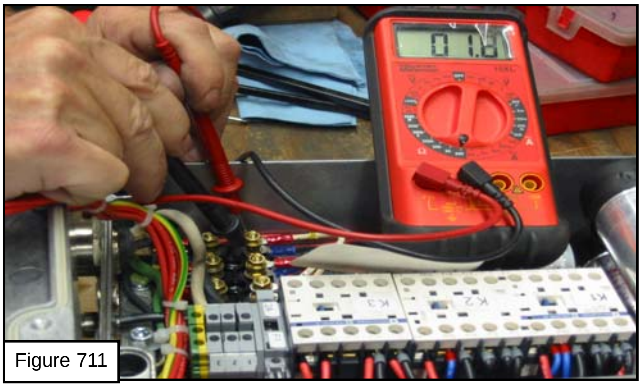
709).

NOTE:
When using an ohm-meter, deduct the test probe resistance from any reading for accuracy. Shown as 0.2 ohms (Figure 710).


Figure 710

7-5 Stator/Winding Check

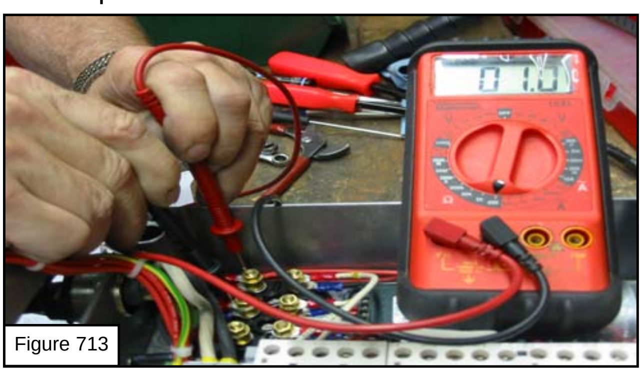
1) With an ohm-meter, measure the resistance of the starting winding W/Z by placing test probes on Position 1(W) and Position 2(Z) of terminal board M1 (3.9 ohms is normal. Figure 711 (on the next page), shows 4.0-0.2 = 1.73 ohms,OK). This is found on the wiring diagram #34427. If the connection is open, the stator must be replaced.


Figure 711

2) Check that the starting winding is not shorted to ground. There should be no continuity between W or Z and the control box casing (Figure 712). If the connection is shorted, the stator must be replaced.


Figure 712

3) With an ohm-meter, measure resistance of the run winding U/V by placing the test probes on position 4(U) and position 5(V) of terminal board M1 (.93 ohms is normal Figure 713, shows 2.2-0.2 = 2.0 ohms). This is found on the wiring diagram #34427. If the connection is open, the stator must be replaced.

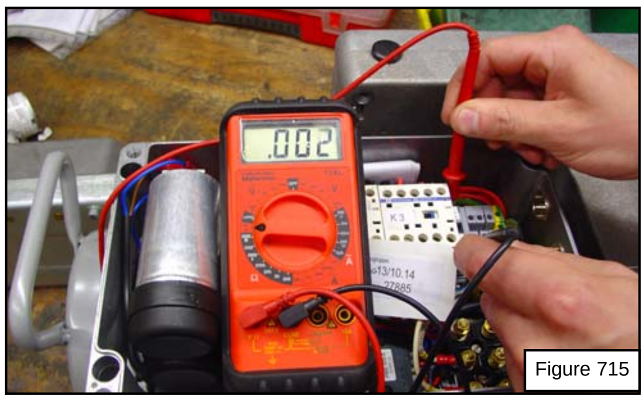

Figure 713

4) Check that the run winding is not shorted to ground. There should be no continuity between U or V and the control box casing (Figure 714). If the connection is shorted, the stator must be replaced.


Figure 714

7-6 Fuse Check, F1 {Code #22366 (110V), Pos. 11, Code #21076 (220V), Pos. 13}

1) With an ohmmeter, check continuity by placing the test probes on X1 and X2 of the fuse. If no continuity is found, replace the fuse with the spare by lifting the grey fuse holder (Figure 715).


Figure 715

NOTE:
The thermal protector opens when the motor is hot in order to prevent damage. It is normally closed and automatically resets.

7-7 Thermal Protector Check
With the ohmmeter, place the test probes on the fuse terminal and X1 of the grey terminal board where the two small wires are fixed (Figure 716 on the next page). If the connection is open, the stator must be replaced.



Figure 716

7-8 Relay Coil Resistance, K1, K2, K3

1) Main relay K3 coil resistance should be approximately 310 ohms. Place the ohmmeter test probes on the A1 and A2 screws of the K3 relay. Check the resistance (Figure 717, shows 315 ohms, OK). If the connnection is open or shorted, replace the K3 relay {Code #60406 (110 V), #60356 (220 V), Pos. 7}.

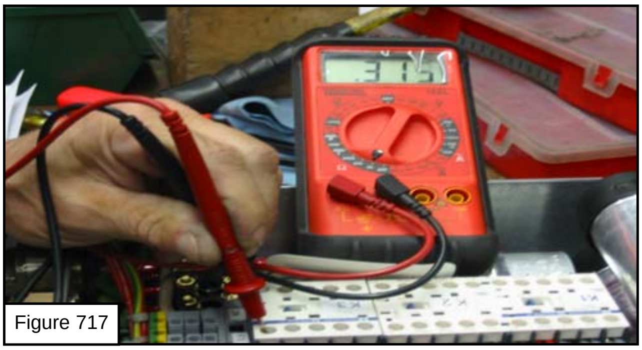


Figure 717

2) The DOWN relay, K2, coil resistance should also be approximately 310 ohms. Place the ohmeter test probes on the A1 and A2 screws of the K2 relay. Check the resistance (Figure 718, shows 312 ohms, OK). If the connection is open or shorted, replace the UP/DOWN double relay {Code #60456 (110 V), #60466 (220 V) Pos. 8}.



Figure 718

3) The UP relay, K1, coil resistance should be approximately 310 ohms. Place the ohmmeter test probes on the A1 and A2 screws of the K3 relay. Check the resistance (Figure 719, shows 305 ohms, OK). If the connection is open or shorted, replace the UP/DOWN double relay {Code #60456 (110 V), #60466 (220 V) Pos. 8}.



Figure 719

7-9 Brake Coil Resistance Check

With the ohmmeter test probes placed on the center two positive(+) and negative(-) terminals of the brake rectifier U1, measure the resistance (Figure 720, shows 333 ohms, OK). It should be approximately 332 ohms. If the connection is open or shorted, replace the brake coil .

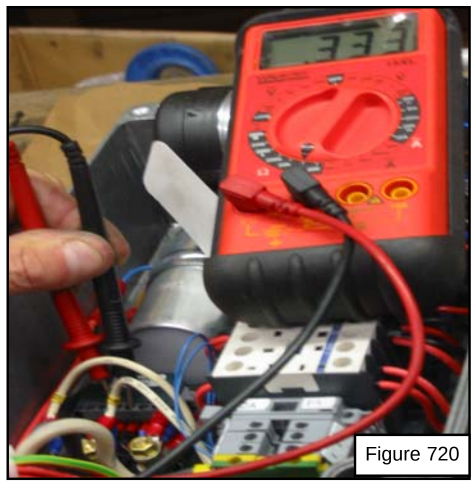


Figure 720

7-10 Capacitor Checks

1) Discharge the capacitors by sliding the K1 or K2, and K3 relays to the right with 2 insulated screwdrivers for several seconds (Figure 721 on the next page).

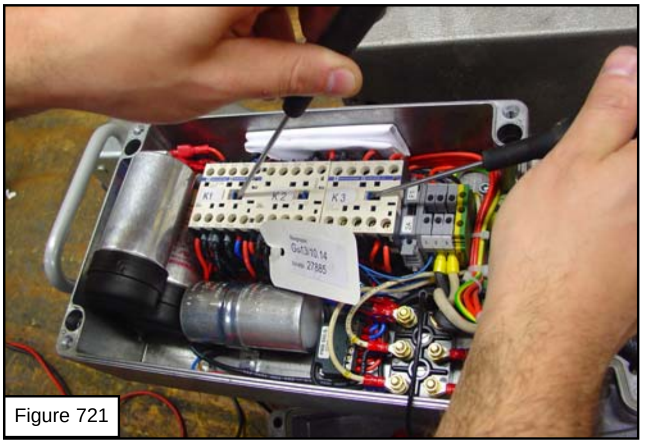


Figure 721

2) With a digital capacitor tester, measure the start and run capacitance by placing the test clips on position 4 and position 6 of the terminal board M1 (Figure 722, shows 277uf, OK). This number is the combination of the start capacitor CA(180uF) + run capacitor(s) CB(35uF) = 250uF +/- 10%. If the total is outside this range, check each capacitor as follows.

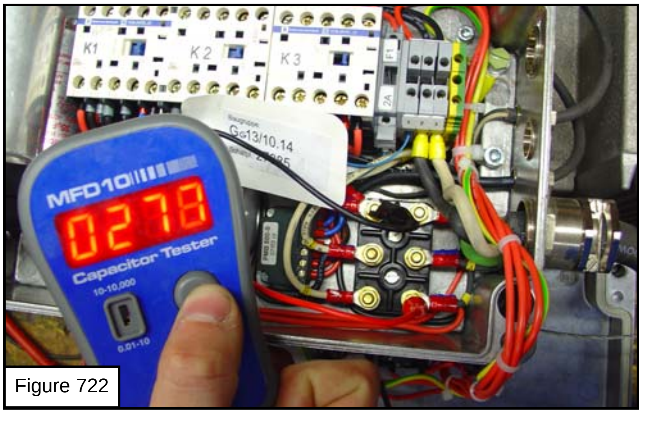


Figure 722

3) The start capacitor CA(180uF) is located on the cover of the control box (Figure 723 shows 196uF, OK). Detach the two insulated spade connectors. With the digital capacitor meter, measure the capacitance. It should be 180uF +/- 10% (162 to 198 uF). If the reading is outside this range, replace the start capacitor {Code #19196 (110 V), #38546 (220 V, Pos. 31}.

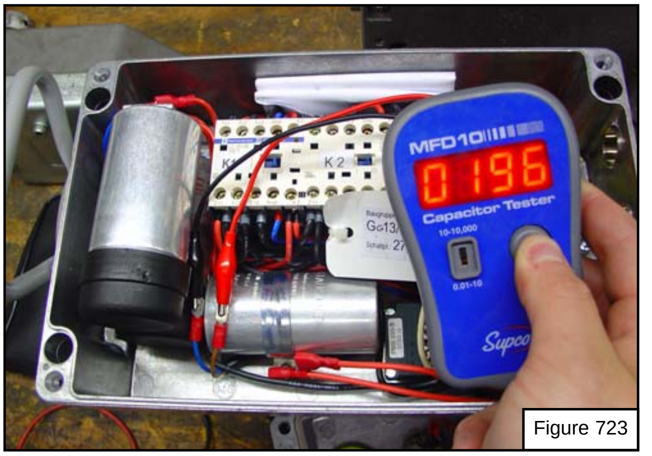


Figure 723

4) The run capacitor CB(35uF) is located in the control box and is larger in size than the start capacitor (Figure 724, shows 39uF, OK). Detach the two insulated space connectors from the capacitor and attach the digital capacitor meter clips to the capacitor. Measure the capacitance. It should read 35uF +/- 10% (32 to 38uF). If the reading is outside this range, replace the run capacitor {Code #23686 (110 V), #42766 (220 V), Pos. 32}.

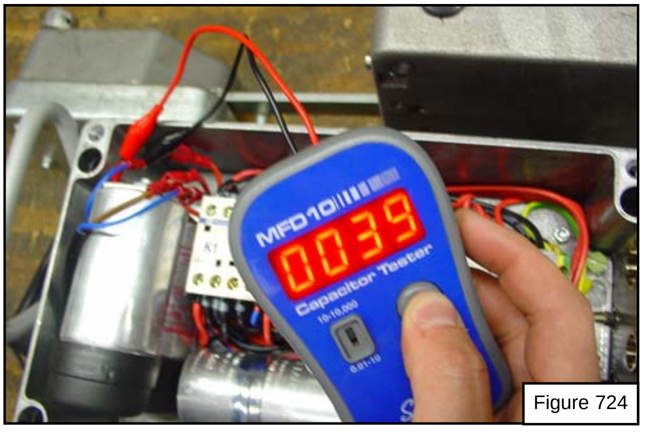


Figure 724

Remember that all the previous tests/rules also apply to the (20mF & 60mF) 220 V Capacitors.

Note: The 220 V XE301P only contains one run capaitor.

7-11 Centrifugal Switch Check

With an ohmmeter, place the the probes on position 5 and 6 of the terminal board M1 (Figure 725 on the next page). The switch should be closed when the motor is not running. When the motor runs, the motor draws high amps and the switch opens. If it stays closed, it is stuck and the switch should be repaired or replaced.



Figure 725

7-12 Pushbutton Checks

1) Contacts are marked NO = "Normally Open" or NC = "Normally Closed". Figure 726 shows continuity for a NC contact. If the button is pressed it should open. A NO switch operates in an opposite manner. Pressing the button closes the switch and creates continuity.

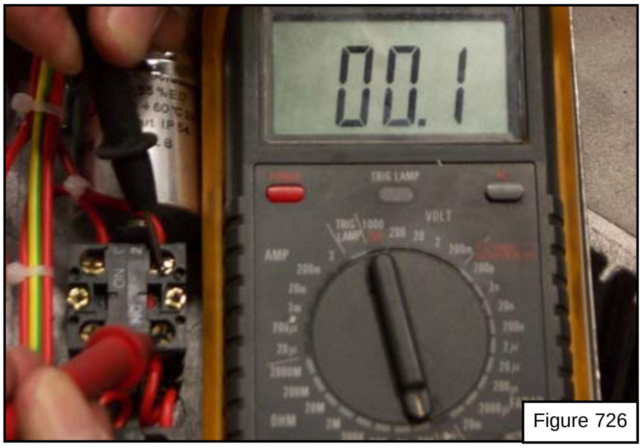


Figure 726

7-13 Control Box Check

1) Tighten the 4 socket head screws {Code #33156, Pos. 37} that hold the control box to the motor (Figure 727).

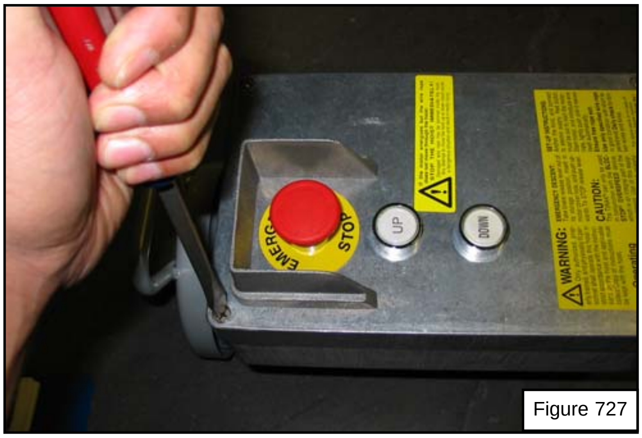


Figure 727

2) Check that the control box base is not distorted or cracked especially at the junction of the box to the motor. If damaged, it must be replaced.

7-15 Power Check

WARNING

The following checks are performed with power to the hoist motor. Whenever power is applied to the hoist, use extreme caution especially with the control box open as part are energized. Only trained and qualified personnel should service the hoist to avoid injury or death.

1) Open the emergency stop by twisting the red knob. It should spring open. This should cause the main relay, K3, to energize.

2) Measure the AC input voltage with a voltmeter at terminal 1 and 3 of the K3 relay (Figure 728). If no voltage occurs, check the fuse and bimetal protector per sections 7-5.

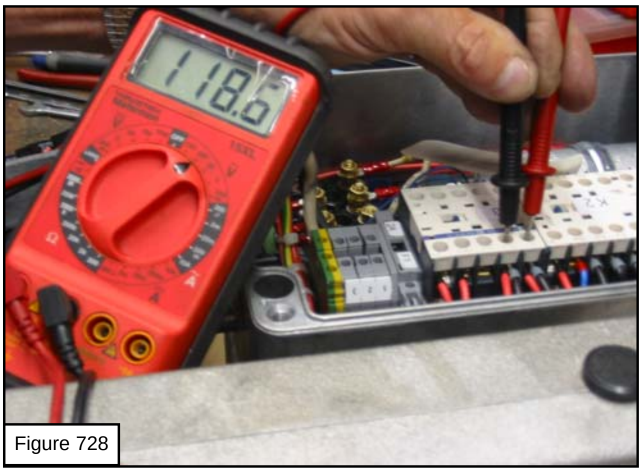


Figure 728

7-16 Brake Rectifier Check {Code #10917, Pos. 10}

1) Push either the up or down button on the control box cover. The motor should run.

2) While the motor is running, measure the AC voltage to the brake rectifier by placing the voltmeter probes on the AC screws of the rectifier (left side terminals marked ~ ~). See Figure 729 which shows 116.6 volts AC to rectifier, OK.

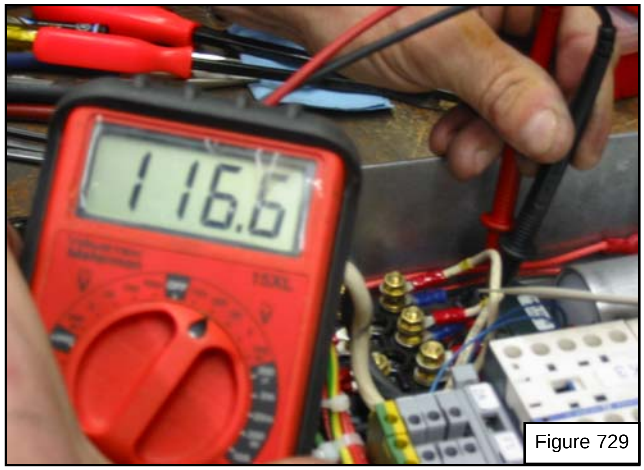


Figure 729

3) The AC voltage to the rectifier should be the same as the input power measured in Section 7-12.

4) Measure the DC voltage from the rectifier. Change the voltmeter to DC. Measure the voltage output from the rectifier at the positive(+) and negative(-) screw terminals (2 center screws) while pressing the UP or DOWN button on the control box cover (Figure 730, which shows 103.2 DC volts from the rectifier, OK). It should read approximately 110 volts. If not approximately 110 volts, replace the rectifier.
For 220 V XE301P: If not approximately 220 volts, replace the rectifier.

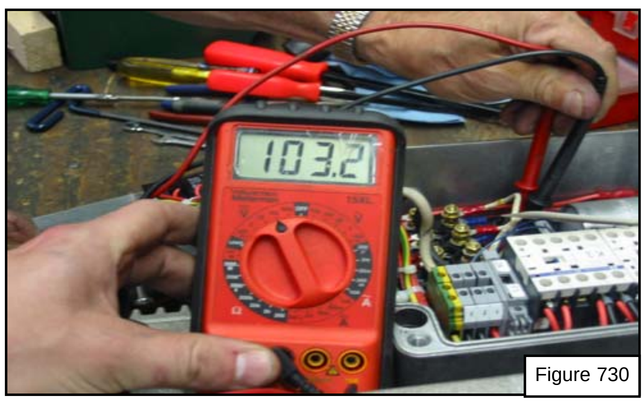


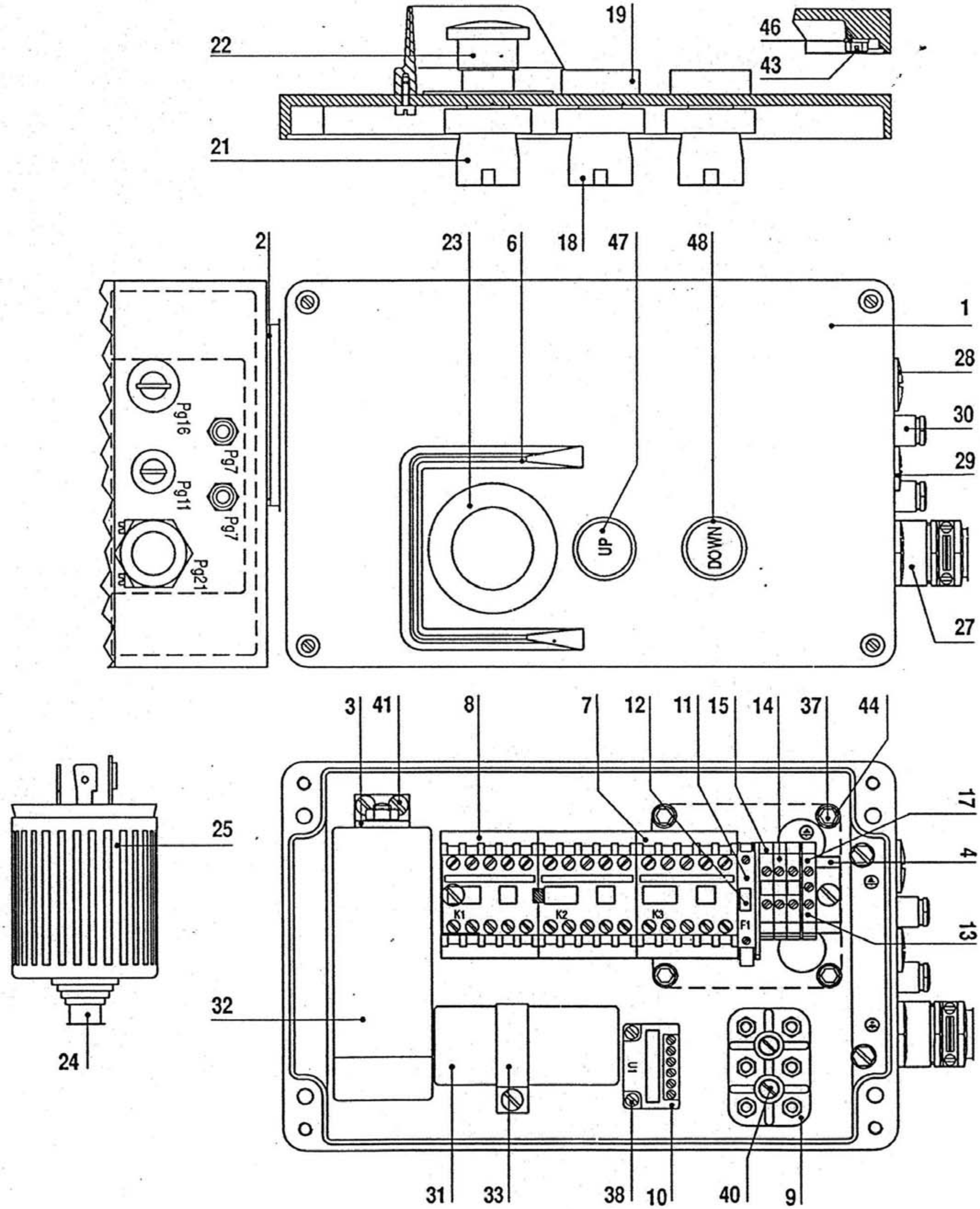
Figure 730

NOTE:
General service on the control box is now complete.

Spare Parts	XE301P - 110V- Direct 110V / 1ph. / 60Hz Wiring Diagram #19225 GG 13/10.14 Plan #19226	Drawing No	E - 3068
		Edition	US-1
		Date	1/05
		Page	1 / 2

Position	Part #	Qty.	Description	Specifications	List Price
-	26647	1	Control box complete GG13/10.14, XE301	110V, Direct	$1,377.25
1	47917	1	Terminal box, empty		$0.00
2	17846	1	GASKET	DK80-112R/02	$2.26
3	65115	1	Angle bracket	25x100x3	$0.00
4	22905	1	Mounting rail	35x180	$0.00
6	35435	1	SWITCH PROTECTION		$64.98
7	60406	1	Contactor / Relay	LC1 K 09 10 F - 110V	$62.70
8	60456	1	Double Contactor / Relay	LC2 K 09 10 F - 110V	$141.82
9	22426	1	TERMINAL BOARD COMPLETE		$20.49
10	10917	1	RECTIFIER		$55.46
11	22366	1	FUSE BLOCK WITH PLATE		$8.76
12	21076	2	2 AMP FINE WIRE FUSE	5x20	$1.26
13	40796	1	EARTH BLOCK M4/6P		$4.90
14	24346	3	TERMINAL BLOCK		$2.80
15	18566	2	Identification labels 1-10		$0.00
17	22856	1	End plate		$0.00
18	21706	2	PUSH BUTTON BLOCK	ZB2BZ105 - NO+NC	$28.80
19	21716	2	PUSH BUTTON COVER	ZB2BA78	$19.63
21	21746	1	"EMERGENCY STOP" BUTTON BLOCK	ZB2BZ102 - NC	$19.48
22	18296	1	"EMERGENCY STOP" BUTTON COVER	ZB2BS54	$31.73
23	37776	1	"EMERGENCY STOP" LABEL		$7.27
24	103	1	Power cord for single phase, per ft.	3 x 10 AWG	$0.00
25a	2311	1	Hubbell plug 20A 125V		$0.00
25b	6031	1	Hubbell plug boot for 3 pol		$0.00
27	15026	1	CABLE BUSHING WITH STRAIN RELIEF PG21-MS	Pg. 21	$10.93
28	18276	1	BLIND PLUG PG 16 MS	Pg. 16	$1.51
29	18256	1	BLIND PLUG PG 11 MS	Pg. 11	$1.13
30	25056	2	CABLE BUSHING PG 7	Pg. 7	$1.61
31	19196	1	START CAPACITOR	180 mF	$76.27
32	23686	2	WORKING CAPACITOR 350 VF 35 MF	35 mF	$82.33
33	18906	1	PIPE CLAMP		$1.90
(34*)	10991	8	Conductor (black)		$0.00
(35*)	11021	3	INSOLATING TUBE 4.2X0.6		$2.49
37	33156	4	SOCKET HEAD CAP SCREW M5X16	M5x15	$0.50
38	17016	2	CHEESE HEAD SKREW M3X12 DIN 84	M3x12	$0.07
40	33126	5	CHEESE HEAD SCREW M4X10 DIN84	M4x10	$0.26
41	16	5	Cheese head screw	M4x8	$0.00
43	7536	4	HEXAGON HEAD CAP SCREW 6X12 DIN 933	M6x12	$1.05
44	16246	4	SPRING WASHER DIA.5 DIN 127	A5	$0.13
46	456	4	Washer	A6.4	$0.00
47	44466	1	Label "UP"		$0.00
48	44476	1	Label "DOWN"		$0.00

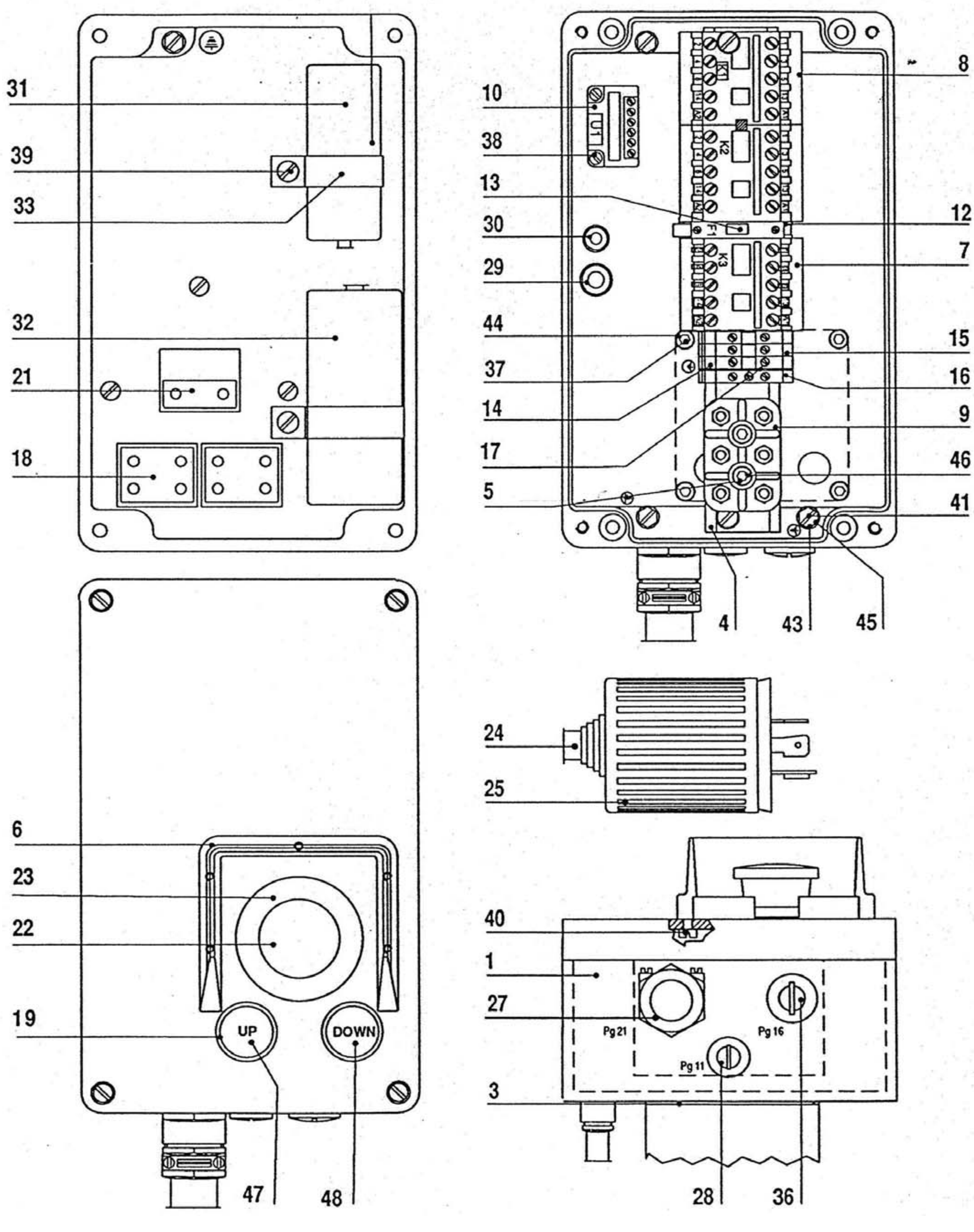
Spare Parts	**XE301P - 110V- Direct** **110V / 1ph. / 60Hz** **Wiring Diagram #19225** **GG 13/10.14** **Plan #19226**	Drawing No Edition Date Page	E - 3068 US-1 1/05 2 / 2



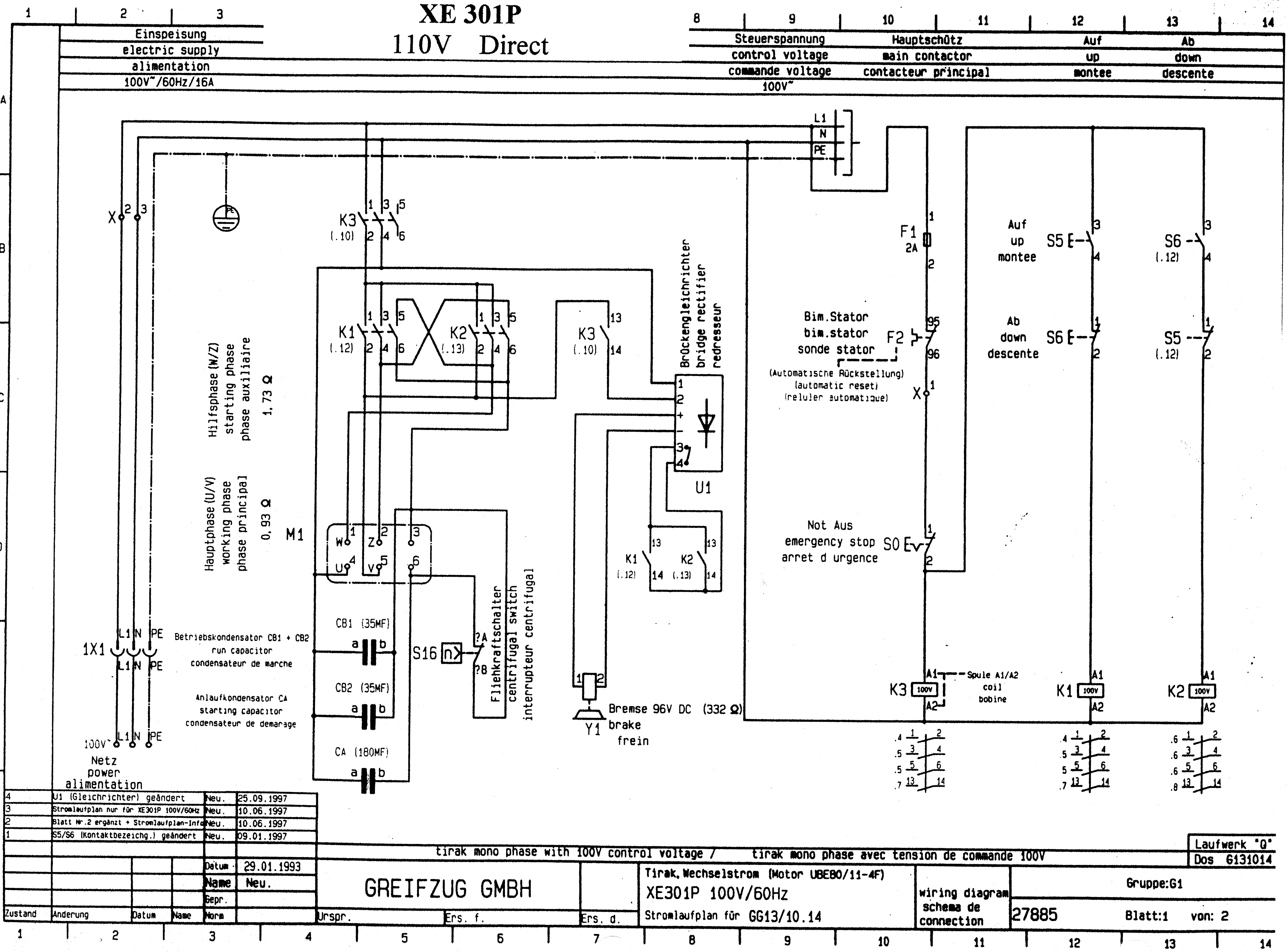
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		Edition	US-1
		Date	1/05
		Page	1 / 2

Position	Part #	Qty.	Description	Specifications	List Price
-	26637	1	Terminal box complete XE301 220V	220V/1ph., Direct	$0.00
1	42757	1	Control box, empty, XE301		$0.00
3	17846	1	GASKET	DK80-112R/02	$2.26
4	43285	1	MOUNTING RAIL	35x244	$12.18
5	35805	1	Distance tube		$0.00
6	35435	1	SWITCH PROTECTION		$64.98
7	60356	1	Contactor / Relay	LC1 K 09 10 P - 220V	$62.70
8	60466	1	Double Contactor / Relay	LC2 K 09 10 P - 220V	$141.82
9	22426	1	TERMINAL BOARD COMPLETE		$20.49
10	10917	1	RECTIFIER		$55.46
12	22366	1	FUSE BLOCK WITH PLATE		$8.76
13	21076	1	2 AMP FINE WIRE FUSE	5x20	$1.26
14	24346	1	TERMINAL BLOCK		$2.80
15	18566	1	Identification labels 1-10		$0.00
16	40796	1	EARTH BLOCK M4/6P		$4.90
17	22856	1	End plate		$0.00
18	21706	1	PUSH BUTTON BLOCK	ZB2BZ105 - NO+NC	$28.80
19	21716	1	PUSH BUTTON COVER	ZB2BA78	$19.63
21	21746	1	"EMERGENCY STOP" BUTTON BLOCK	ZB2BZ102 - NC	$19.48
22	18296	1	"EMERGENCY STOP" BUTTON COVER	ZB2BS54	$31.73
23	37776	1	"EMERGENCY STOP" LABEL		$7.27
24	103	1	Power cord for single phase, per ft.	3 x 10 AWG	$0.00
25a	2421	1	Hubbell plug 20A/250V/4 pole		$0.00
25b	6031	1	Hubbell plug boot for 3 pol		$0.00
27	15026	1	CABLE BUSHING WITH STRAIN RELIEF PG21-MS	Pg. 21	$10.93
28	18256	1	BLIND PLUG PG 11 MS	Pg. 11	$1.13
29	23926	1	CABLE BUSHING PG 9	Pg. 9	$1.90
30	25056	1	CABLE BUSHING PG 7	Pg. 7	$1.61
31	38546	1	STARTING CAPACITOR 60MF XE301 220V XE701	60 mF	$45.97
32	42766	1	RUN CAPACITOR	20 mF	$105.31
33	18906	1	PIPE CLAMP		$1.90
(34*)	10991	1	Conductor (black)		$0.00
(35*)	11021	1	INSOLATING TUBE 4.2X0.6		$2.49
36	18276	1	BLIND PLUG PG 16 MS	Pg. 16	$1.51
37	33156	1	SOCKET HEAD CAP SCREW M5X16	M5x15	$0.50
38	17016	1	CHEESE HEAD SKREW M3X12 DIN 84	M3x12	$0.07
39	10236	1	CHEESE HEAD SCREW M5X8 DIN84	M5x8	$0.39
40	33126	1	CHEESE HEAD SCREW M4X10 DIN84	M4x10	$0.26
41	7536	1	HEXAGON HEAD CAP SCREW 6X12 DIN 933	M6x12	$1.05
43	16616	1	SPRING WASHER A6 DIN 127	A6	$0.13
44	16246	1	SPRING WASHER DIA.5 DIN 127	A5	$0.13
45	456	1	Washer	A6.4	$0.00
46	23616	1	HEXAGON NUT M5 DIN 934	M5	$0.26
47	44466	1	Label "UP"		$0.00
48	44476	1	Label "DOWN"		$0.00

Spare Parts	**XE301P - 220V/1ph. - Direct**	Drawing No	E - 3061
	220V / 1ph. / 60Hz **Wiring Diagram #19219**	Edition	US-1
		Date	1/05
	GG 13/10.3 **Plan #19220**	Page	2 / 2



XE 301P
110V Direct



Betriebsmittel Kennzeichnung nach DIN 40719 /2 material specification according to DIN 40719/2 specification du materiel selon DIN 40719/2	Benennung und Verwendung specification and use specification et destination	Betriebsmittel Kennzeichnung nach DIN 40719 /2 material specification according to DIN 40719/2 specification du materiel selon DIN 40719/2	Benennung und Verwendung specification and use specification et destination
CA	Anlaufkondensator starting capacitor condensateur de demarage	1X1	Netzanschlußstecker current supply connector commut.des tensions d'aliment.
CB1 + CB2	Betriebskondensator run capacitor condensateur de marche	Y1	Bremse brake frein
F1	Steuersicherung control fuse commande fusible		
F2	Bim.Stator bim.stator sonde stator		
K1	Schütz "Auf" contactor "up" contacteur "montee"		
K2	Schütz "Ab" contactor "down" contacteur "descente"		
K3	Hauptschütz main contactor contacteur principal		
M1	Motorklemmbrett motor terminal board moteur planche a bornes		
S0	Taster "Not Aus" push button "emergency stop" bouton "arret d'urgence"		
S5	Taster "Auf" push button "up" bouton "montee"		
S6	Taster "Ab" push button "down" bouton "descente"		
S16	Fliehkraftschalter centrifugal switch interrupteur centrifugal		
U1	Brückengleichrichter bridge rectifier redresseur		
X	Klemmleiste connector block plate de borne		

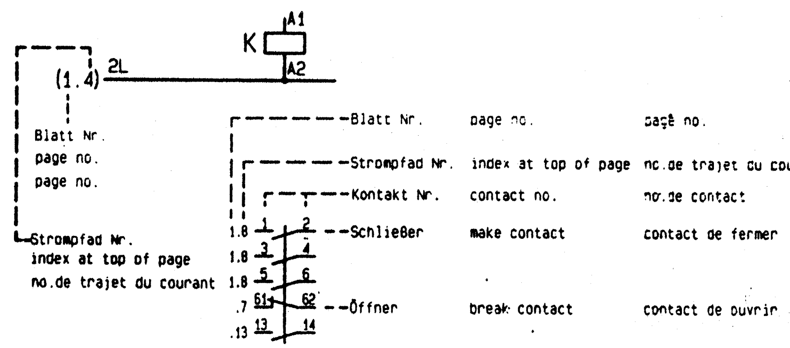
Erläuterung: Kontaktdarstellung + Kontaktspiegel
explanation: contact representation + contact configuration
explication: contact presentation + contact formation

Strompfad Nr.
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Kontaktdarstellung
contact representation
contact presentation



Kontaktspiegel
contact configuration
contact formation



Blatt Nr. page no. page no.
von Nr. of no. par no.

tirak mono phase with 100V control voltage / tirak mono phase avec tension de commande 100V

Zustand	Änderung	Datum	Name				
				Datum	10.06.1997	GREIFZUG GMBH	
				Name	Neu.		
				Gepr.			
				Norm		Urspr. / Ers. f. / Ers. d.	

Tirak, Wechselstrom (Motor UBE80/11-4F)
XE301P 100V/60Hz
Stromlaufplan für GG13/10.14

wiring diagram
schema de connection

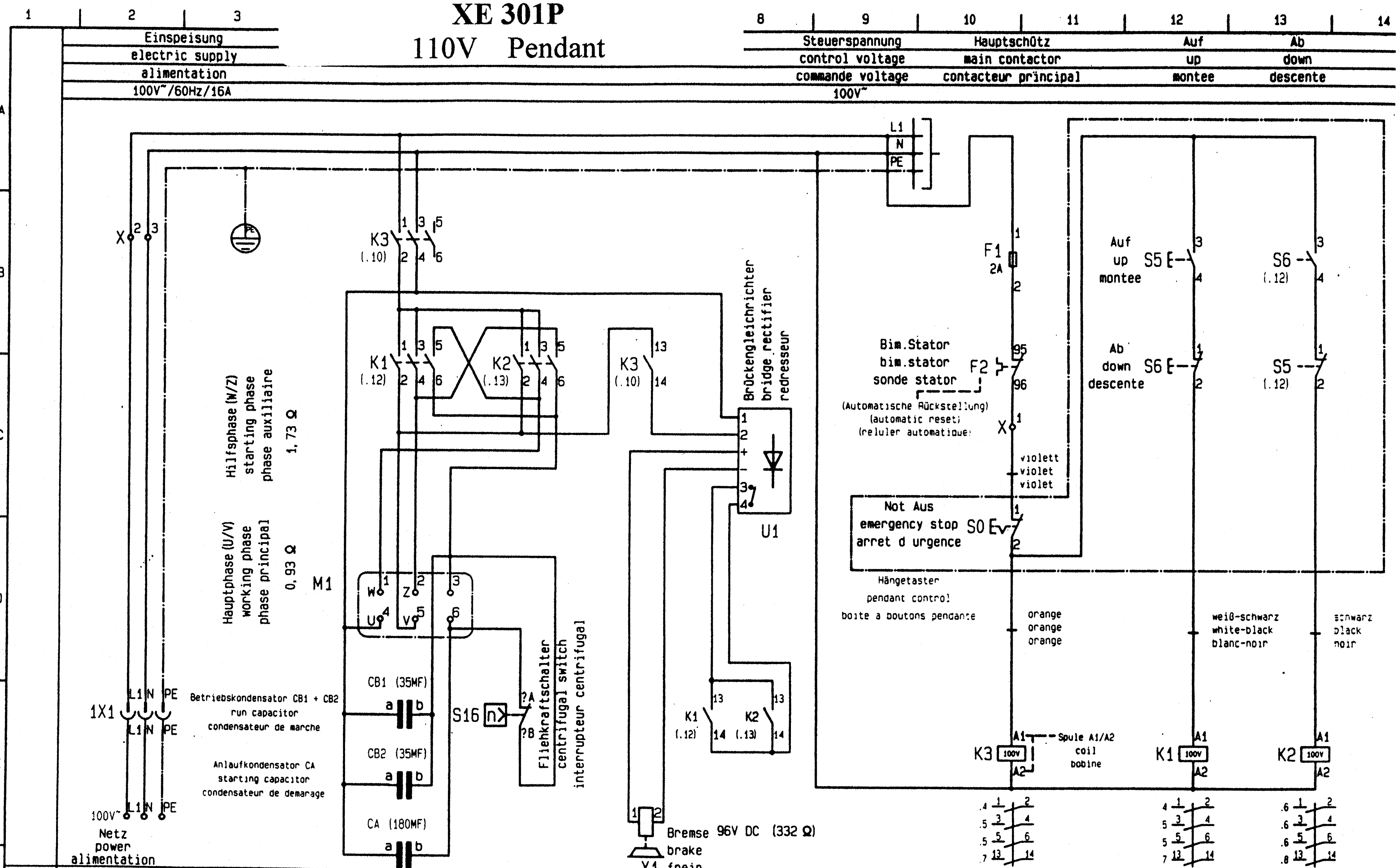
27885

Laufwerk
Dos 613101

Gruppe:

Blatt:2 von: 2

XE 301P
110V Pendant



4	U1 (Gleichrichter) geändert		Koch	18.08.1997
3	Stromlaufplan nur für XE301P 100V/60Hz		Neu.	10.06.1997
2	Blatt Nr.2 ergänzt + Stromlaufplan-Info		Neu.	10.06.1997
1	S5/S6 (Kontaktbezeichg.) geändert		Neu.	09.01.1997
Zustand	Änderung	Datum	Name	

Neue Stromlaufplan Nr 31010 für XE301P 100V/60Hz
Ursprüngliche Stromlaufplan Nr.27885 von GG13/10.14

tirak mono phase with 100V control voltage / tirak mono phase avec tension de commande 100V

Laufwerk "Q"
Dos 6131014

Datum	29.01.1993
Name	Neu.
Gepr.	
Norm	

GREIFZUG GMBH

Urspr. | Ers. f. | Ers. d.

Tirak, Wechselstrom (Motor UBE80/11-4F)
XE301P 100V/60Hz
Stromlaufplan für GG13/10.14A

wiring diagram
schema de connection

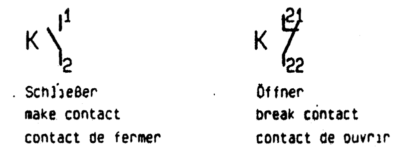
Gruppe:G1
31010 Blatt:1 von: 2

Betriebsmittel Kennzeichnung nach DIN 40719 /2 material specification according to DIN 40719/2 specification du materiel selon DIN 40719/2	Benennung und Verwendung specification and use specification et destination	Betriebsmittel Kennzeichnung nach DIN 40719 /2 material specification according to DIN 40719/2 specification du materiel selon DIN 40719/2	Benennung und Verwendung specification and use specification et destination
CA	Anlaufkondensator starting capacitor condensateur de demarage	1X1	Netzanschlußstecker current supply connector commut.des tensions d'aliment.
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K2	Schütz "Ab" contactor "down" contacteur "descente"		
K3	Hauptschütz main contactor contacteur principal		
M1	Motorklemmbrett motor terminal board moteur planche a bornes		
S0	Taster "Not Aus" push button "emergency stop" bouton "arret d'urgence"		
S5	Taster "Auf" push button "up" bouton "montee"		
S6	Taster "Ab" push button "down" bouton "descente"		
S16	Fliehkraftschalter centrifugal switch interrupteur centrifugal		
U1	Brückengleichrichter bridge rectifier redresseur		
X	Klemmleiste connector block plate de borne		

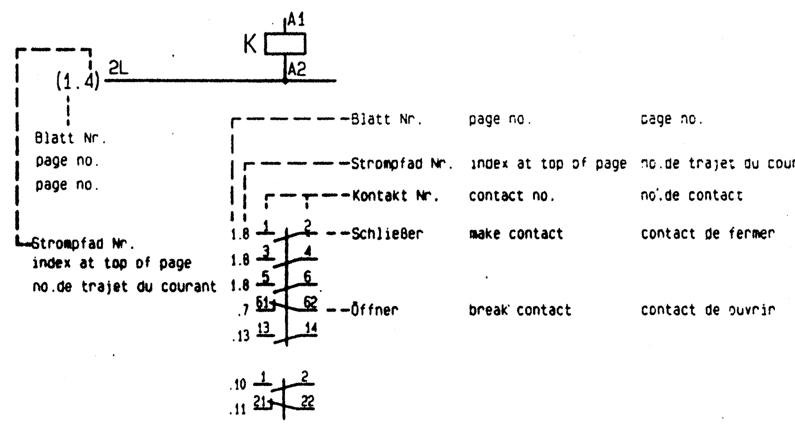
Erläuterung: Kontaktdarstellung + Kontaktspiegel
explanation: contact representation + contact configuration
explication: contact presentation + contact formation

Strompfad Nr.
index at top of page
no.de trajet du courant

Kontaktdarstellung
contact representation
contact presentation



Kontaktspiegel
contact configuration
contact formation



Blatt Nr. / page no. / page no. — von Nr. / of no. / par no.

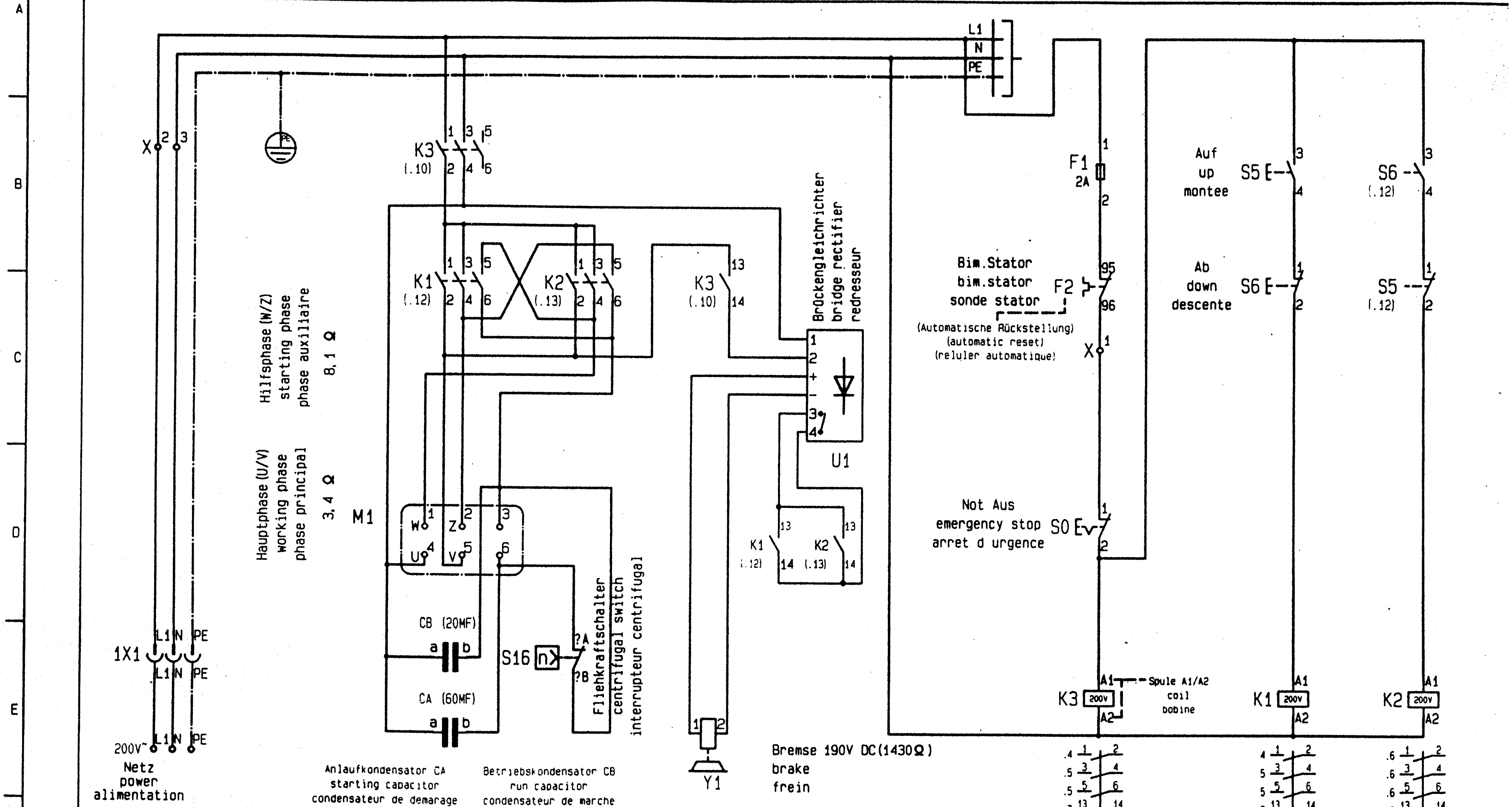
tirak mono phase with 100V control voltage / tirak mono phase avec tension de commande 100V

Zustand	Änderung	Datum	Name						
				Datum 10.06.1997	GREIFZUG GMBH		Tirak, Wechselstrom (Motor UBE80/11-4F) XE301P 100V/60Hz Stromlaufplan für GG13/10.14A	wiring diagram schema de connection	Laufwerk Dos 613101 Gruppe:G 31010 Blatt:2 von: 2
				Name Neu.					
				Gepr.					
				Norm	Urspr.	Ers. f.	Ers. d.		

XE 301P

220V/ 1ph. Direct

Einspeisung / electric supply / alimentation	200V~/60Hz/16A
Steuerspannung / control voltage / commande voltage	200V~
Hauptschütz / main contactor / contacteur principal	
Auf / up / montee	
Ab / down / descente	



Zustand	Änderung	Datum	Name
4	U1 (Gleichrichter) geändert	Koch	19.09.1997
3	Stromlaufplan nur für XE301P 200V/60Hz	Neu.	09.06.1997
2	Blatt Nr.2 ergänzt + Stromlaufplan-Info	Neu.	09.06.1997
1	S5/S6 (Kontaktbezeichng.) geändert	Neu.	09.06.1997

tirak mono phase with 200V control voltage / tirak mono phase avec tension de commande 200V

Laufwerk "I
Dos GG1310

Datum	24.05.1993		
Name	Neu.		
Gepr.			
Norm			

GREIFZUG GMBH

Urspr. | Ers. f. | Ers. d.

Tirak, Wechselstrom (Motor UBE80/11-4F)
XE301P 200V/60Hz
Stromlaufplan für GG13/10.3

wiring diagram
schema de
connection

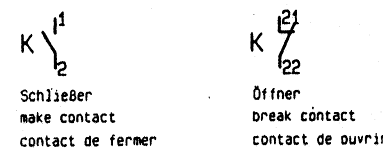
Gruppe:G1
19221 Blatt:1 von: 2

Betriebsmittel Kennzeichnung nach DIN 40719 /2 material specification according to DIN 40719/2 specification du materiel selon DIN 40719/2	Benennung und Verwendung specification and use specification et destination	Betriebsmittel Kennzeichnung nach DIN 40719 /2 material specification according to DIN 40719/2 specification du materiel selon DIN 40719/2	Benennung und Verwendung specification and use specification et destination
CA	Anlaufkondensator starting capacitor condensateur de demarage	1X1	Netzanschlußstecker current supply connector commut.des tensions d'aliment.
CB	Betriebskondensator run capacitor condensateur de marche	Y1	Bremse brake frein
F1	Steuersicherung control fuse commande fusible		
F2	Bim.Stator bim.stator sonde stator		
K1	Schütz "Auf" contactor "up" contacteur "montee"		
K2	Schütz "Ab" contactor "down" contacteur "descente"		
K3	Hauptschütz main contactor contacteur principal		
M1	Motorklemmbrett motor terminal board moteur planche a bornes		
S0	Taster "Not Aus" push button "emergency stop" bouton "arret d'urgence"		
S5	Taster "Auf" push button "up" bouton "montee"		
S6	Taster "Ab" push button "down" bouton "descente"		
S16	Fliehkraftschalter centrifugal switch interrupteur centrifugal		
U1	Brückengleichrichter bridge rectifier redresseur		
X	Klemmleiste connector block plate de borne		

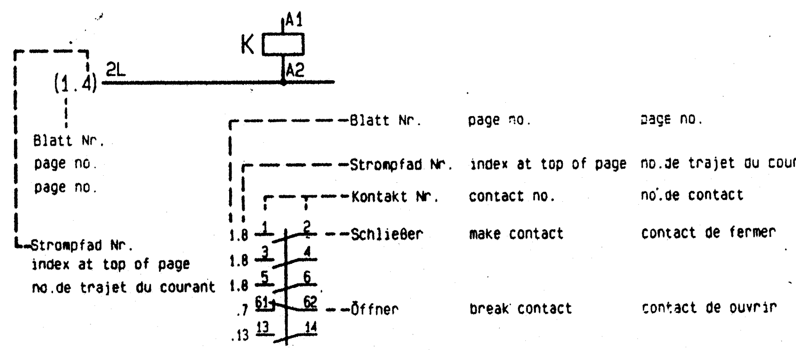
Erläuterung: Kontaktdarstellung + Kontaktspiegel
explanation: contact representation + contact configuration
explication: contact presentation + contact formation

Strompfad Nr.
index at top of page
no.de trajet du courant

Kontaktdarstellung
contact representation
contact presentation



Kontaktspiegel
contact configuration
contact formation



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von Nr. of no. par no.

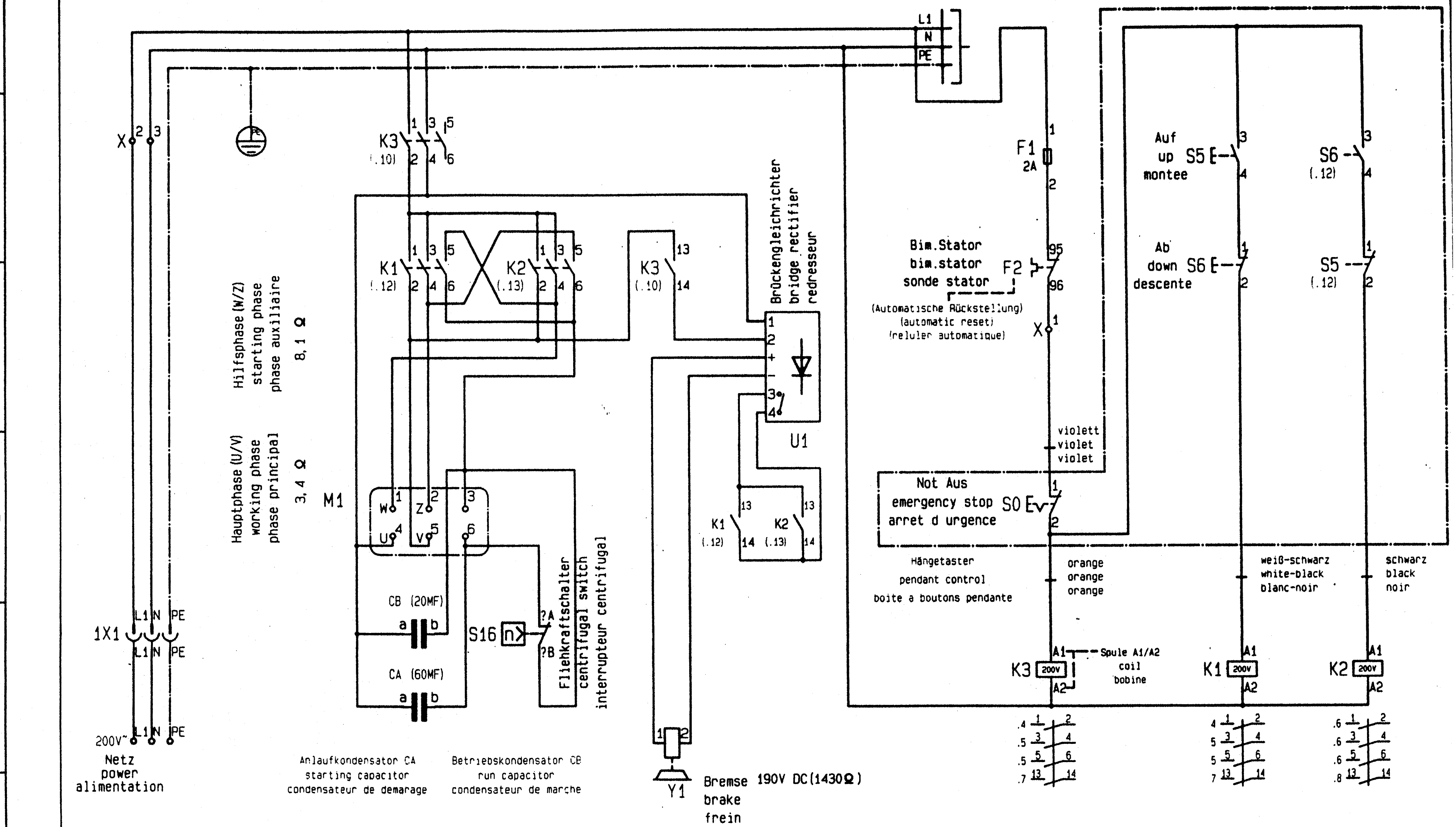
Laufwerk "]
Dos 661310

tirak mono phase with 200V control voltage / tirak mono phase avec tension de commande 200V

Zustand	Änderung	Datum	Name				
Datum	09.06.1997	GREIFZUG GMBH	Tirak, Wechselstrom (Motor UBE80/11-4F) XE301P 200V/60Hz Stromlaufplan für GG13/10.3	wiring diagram schema de connection	19221	Gruppe:	
Name	Neu.					Blatt:2	von: 2
Gepr.							
Norm		Urspr.	Ers. f.	Ers. d.			

XE 301P
220V/ 1ph. Pendant

Einspeisung / electric supply / alimentation	Steuerspannung / control voltage / commande voltage	Hauptschütz / main contactor / contacteur principal	Auf / up / montee	Ab / down / descente
200V~/60Hz/16A	200V~			



1	U1 (Gleichrichter) geändert	Koch	18.08.1997

tirak mono phase with 200V control voltage / tirak mono phase avec tension de commande 200V

Laufwerk "I"
Dos GG13104

Datum	09.06.1997
Name	Neu.
Gepr.	
Norm	

Zustand | Änderung | Datum | Name | Urspr. | Ers. f. | Ers. d.

GREIFZUG GMBH

Tirak, Wechselstrom (Motor UBE80/11-4F)
XE301P 200V/60Hz
Stromlaufplan für GG13/10.4

wiring diagram
schema de connection

31009

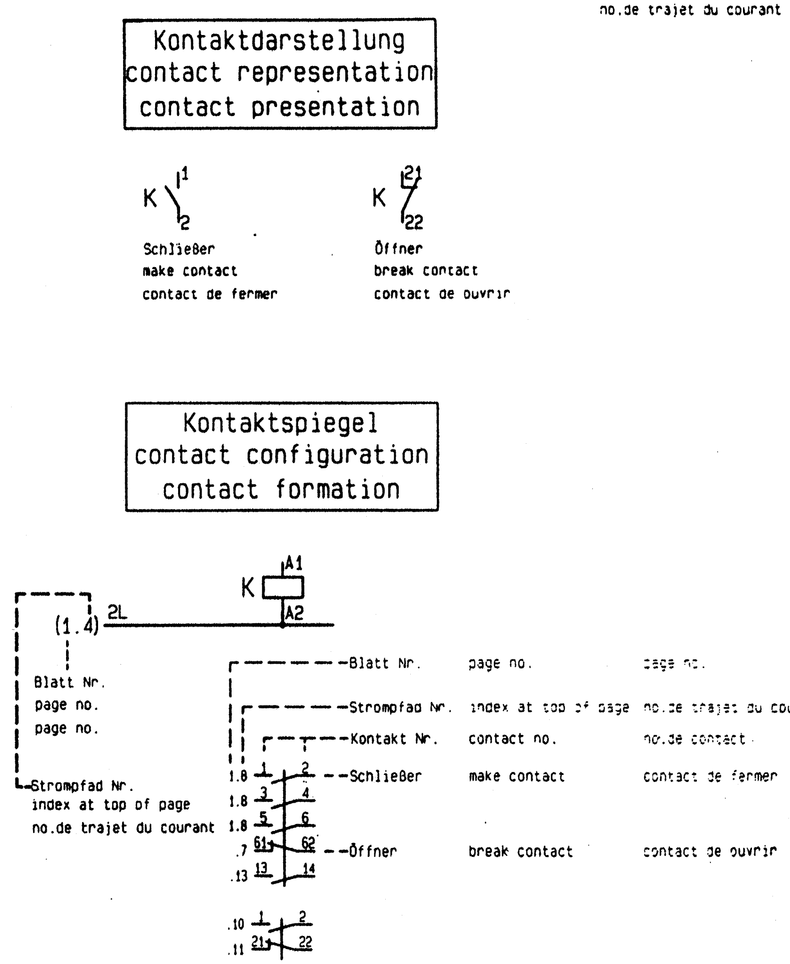
Gruppe: G1

Blatt: 1 von: 2

Betriebsmittel Kennzeichnung nach DIN 40719 /2 material specification according to DIN 40719/2 specification du materiel selon DIN 40719/2	Benennung und Verwendung specification and use specification et destination	Betriebsmittel Kennzeichnung nach DIN 40719 /2 material specification according to DIN 40719/2 specification du materiel selon DIN 40719/2	Benennung und Verwendung specification and use specification et destination
CA	Anlaufkondensator starting capacitor condensateur de demarage	1X1	Netzanschlußstecker current supply connector commut.des tensions d'aliment.
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K1	Schütz "Auf" contactor "up" contacteur "montee"		
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K3	Hauptschütz main contactor contacteur principal		
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S0	Taster "Not Aus" push button "emergency stop" bouton "arret d'urgence"		
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U1	Brückengleichrichter bridge rectifier redresseur		
X	Klemmleiste connector block plate de borne		

Erläuterung: Kontaktdarstellung + Kontaktspiegel
explanation: contact representation + contact configuration
explication: contact presentation + contact formation

Strompfad Nr.
index at top of page
no.de trajet du courant



Blatt Nr. page no. page no.
von Nr. of no. par no.

tirak mono phase with 200V control voltage / tirak mono phase avec tension de commande 200V

Zustand	Änderung	Datum	Name						
				Datum: 09.06.1997	GREIFZUG GMBH	Tirak, Wechselstrom (Motor UBE80/11-4F) XE301P 200V/60Hz Stromlaufplan für GG13/10.4	wiring diagram schema de connection	31009	Laufwerk Dos GG131 Gruppe: Blatt: 2 von: 2
				Name: Neu.	Urspr.	Ers. f.	Ers. d.		
				Gepr.					
				Norm					

8-5 Wiring Connection of Stator XE301P

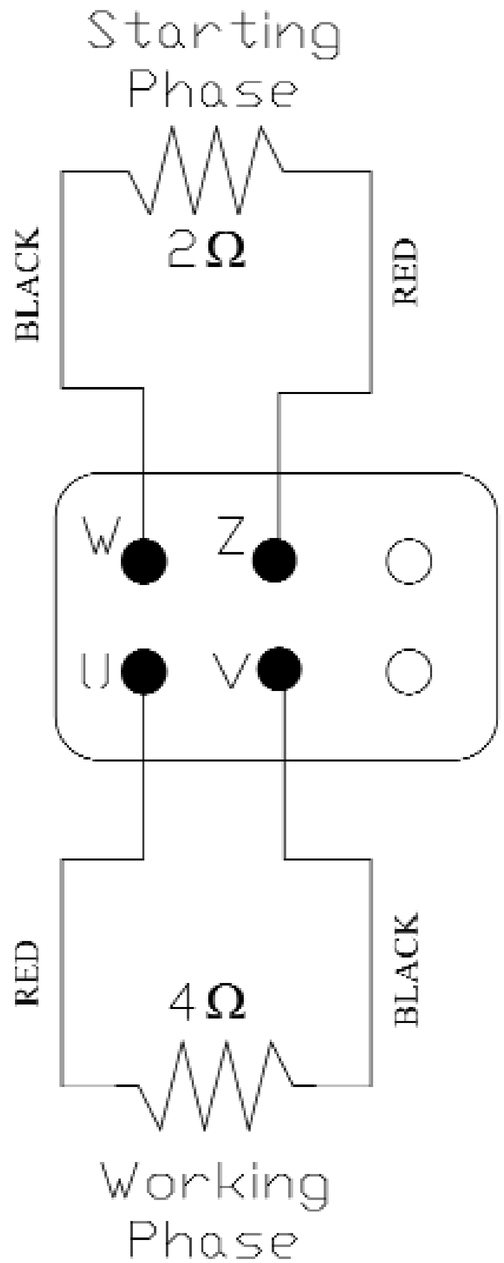


Figure 801

9) WIRE ROPE SPECIFICATION TIRAK

There seems to be some question as to selection of wire rope due to the many people offering wire rope today

Before Tractel chooses a supplier of wire rope we run an endurance test or cycle test to make certain that the rope functions well in the hoist and has good life. The European norms require 1000 cycles minimum, UL testing requires 500 cycles. We require 2000 cycles and test with a high-speed hoist 60 ft./ min. to give a more severe dynamic load to the wire rope during starts and stops. After 2000 cycles we allow a certain number of broken wires (not strands) in a given length of rope. Too many breaks are a test failure. We have no idea how or if other rope suppliers test a rope with our hoist. We generally do not test other peoples ropes because it is time consuming and expensive to conduct. We would be inundated with samples.

5 X 19 vs. 5 X 26 Construction 5 strands of 26 wires have smaller wires making up the strands. This provides greater flexibility but smaller outside wires wear out faster during normal use. Smaller wires are less resistant to abrasion. Therefore we primarily recommend 5 X 19. PI equipment often uses 5 X 26 because winders are part of the system and it coils better.

Quality of Manufacture- If a good control is not made on the tension during manufacture, then a loose strand can occur. This shows when lowering a load. It can cause a jam. Preforming requires that tension be monitored. To get a high quality rope requires that high quality wires be used creating very tight tolerances. A poor zinc plating process can cause slippage. Ropes must be lubricated properly or the friction coefficient is poor between the wire rope and the sheave.There should not be a change in the diameter of the wire rope when worn.

Summary- There is much more to wire rope selection than number of strands and number of wires. Tractel supplies only high quality and rigorously tested wire rope from a very few carefully selected and monitored manufacturers.

9-1 Wire Rope Specifications - XE301P (Page 1 of 2)

	1st Choice	**2nd** Choice
Hoist Types:	Tirak	Tirak
Construction:	5 x 19	5 x 26
Strands	5	5
Wires per strand	19	26
Core Type	Polypropylene splitfilm	same
Type	Warrington Seale	same
Diameter:	8.4 mm +0 -0.3mm{8.1 - 8.4 mm} 5/16" approx. {0.319 - 0.326” }	same
Minimum Breaking Load:	10,000 lbs. [4590 kg]	same
Material of Construction:	Galvanized Steel wire rope XIPS 200/220 n/ sq. mm	same
Rope Lay:	Right hand Regular Lay	same
Lubrication:	Core Lubricated	same
Preformed:	Yes	same

Table 1001

9-1 Wire Rope Specifications - XE301P (Page 2 of 2)

NOTE:
As of 2/15/2002, 5/16" diameter should be used (as taken from various product literature).

4 x 26	6 x 19	6 x 31	5 x 19	5 x 26
Skyclimber CX1250 Compact Alpha1000	Skyclimber CS1250 IWRC/RC Alpha1500 3/8	Hilo	Tirak/Saturn all models 1st choice L-series	Skyclimber CX1250 Compact Alpha1000
Tirak 3rd choice T-series X-series	Spider Z-Mac1000 IWRC SC40 IWRC			
Saturn 3rd choice 35X series 32L series	Power Climber PC400 IWRC/RC Astro IWRC/FC 5/16 or 3/8	Power Climber PC400 IWRC/FC		Power Climber PC400, Astro Compacted
	Skyman 6 x17 IWRC	Lisbon Hoist 180-050 180-030		Tirak/Saturn all models 2nd choice (1st for reelers) L-series
	Saturn 4th choice 35X series 32L series			
	Tirak 4th choice T-series X-series			

Table 1002

9-2 Labels and Nameplates

(1) Advice Label (secondary brake operation)
(Please call for pricing)

NOTICE: This hoist is equipped with a controlled descent device that will automatically engage in case of primary brake failure. Descent can be stopped with manual operation of the secondary brake.

(2) TIRAK nameplate
Code # 22760 $8.10

tirak® Model LE P
Made in Germany
US Patent No. 3,905,767 / 4,193,311 / 4,045,741 / 4,706,940
Other U.S. Patents pending.

Rated load: lbs kgs
Travel speed: ft/min m/min
Operating voltage: VAC
Current consumption: A
Power-supply cord: #10, Type STO, 600 VAC.
Maximum length: 260 ft. at 110 VAC, 750 ft. at 220 VAC.
Do not let the voltage at motor terminals drop below motor nameplate rating **under load**
Serial No.:
Year of manufacture: 200 /
Wire rope diameter: in mm
Wire rope classification/construction 5x19, 4x26, or 5x26 with fiber core, or 6x19, (min. 17 wires per strand), galvanized or black, lubricated, preformed, IPS or XIPS
C441 09/01 Printed in Germany
Supplier's address

(3) BLOCSTOP nameplate
Code # 25920 $6.40

BLOCSTOP®
secondary brake

Model	Serial number
BSO	

Rated load	Wire rope Ø	Year of manuf.
kg lbs	mm in	

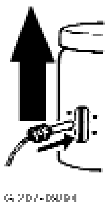
CHECKING

1) Before going aloft, daily check as follows:
   - At ground level push DOWN button and allow the wire rope to form a bow between TIRAK® casing and BSO secondary brake.
     With gloved hands **sharply pull wire rope upwards** – the BSO secondary **brake should close immediately**.
     Lift platform 3 ft. (1 m) above ground or safe surface, and **push EMERGENCY STOP** button of the BSO secondary brake.
     Lower the platform to **check that** the BSO secondary **brake holds the load**.
     Raise platform until the hoist supports the load. Reset BSO secondary brake by pushing down control lever until it locks.
2) During operation **centrifugal weights must rotate**.
   Check regularly through the window.

WARNING: If during the above checks the **BLOCSTOP malfunctions, replace it** and return to the supplier for inspection. Address see TIRAK nameplate.

Made in Germany

(4) Emergency Descent Label
(Please call for pricing)



Notablaß
Bremslösterhebel im Handgriff
Emergency Descent
Brake release lever in TIRAK handle
Descente d'urgence
Manette de commande du frein dans la poignée de portage
G 207-08/94

(5) Motor nameplate
Code # 16206

GREIFZUG GmbH Bergisch Gladbach

Type		Nr.	
1-Mot	60 Hz		
	kW		cos φ
	V		A
Schalt	Schutzart IP 55		Is.Kl.

(6) Primary brake nameplate
Code # 16706 $2.15

GREIFZUG GmbH Bergisch Gladbach

Bremstyp			
Leistung	W	Spulenspannung	V
Moment	Nm		

(7) Warning Label (wire rope jam)
(Please call for pricing)

If the motor energizes but the wire rope does not move through the hoist:
STOP THE HOIST IMMEDIATELY!
Damaged wire rope may be jammed inside the hoist. Any attempt to move the hoist up or down could cause a dangerous situation and result in bodily injury.

(8) BLOCSTOP check plate
(Please call for pricing)

ADDITIONAL CHECKING
At ground level push DOWN button to get slack primary wire rope – release lever tilts to the side to close BS/BSO secondary brake for the secondary wire rope.
With gloved hands try to **pull the secondary wire rope upwards**: it **must be impossible**

(9) Wire rope diameter label
(Please call for pricing)

Wire rope
Ø
5/16"

(10) General Warning & Advice Label
(Please call for pricing)

WARNING: Only authorized, properly trained, and physically fit personnel shall operate this hoist in strict accordance with the instructions on the hoist and applicable codes! Copy of instructions must be kept with the hoist.

Operating WARNING:
Immediately STOP RUNNING THE HOIST, if wire rope does not move through.

EMERGENCY DESCENT:
Take brake release lever out of TIRAK® handle, and insert in motor cover hole. Push lever upwards.
To STOP release lever.

CAUTION: The TIRAK® can only be used in conjunction with the **BLOCSTOP OVERSPEED** device, which is an integral part of the equipment. Use of this equipment is unsafe and unlawful without proper fall protection equipment used in accordance with OSHA requirements.

SET-UP INSTRUCTIONS: Anchor the hoist, and connect to electric supply. Red button must be out to start the motor.
Start motor, and introduce wire rope, until it reeves itself automatically.
Ensure free rope exit.
Use only specified wire rope in good condition with short tapered end! **Daily check** for broken wires and kinks.

For spare parts or in case of inquiry please mention
Machine Type and Serial No.!

G442-03/01 Printed in Germany

9-3 Checklist

NOTE:
Completion of the checklist MUST always be done before operating the hoist.

TIRAK Hoist Inspection Check List

See Preventive Maintenace Section of instruction manual for details.

Check only components applicable for specific equipment and inspection type.

TIRAK hoist model: ____________

Serial-No: ____________

	YES	NO
WIRE ROPE HOOKS		
Cracks	☐	○
Excessive wear	☐	○
Bent	☐	○
Spreading	☐	○
Latch damaged/missing	☐	○
BRAKES		
Motor brake worn or not operating	☐	○
Excessive loadbrake drift or backlash	☐	○
Excessive disc wear	☐	○
LIMIT SWITCHES		
Operating properly	○	☐
HOUSING		
Distorted	☐	○
Cracks	☐	○
Loose hardware	☐	○
Bearing noise	☐	○
WIRING		
Loose connections	☐	○
Frayed	☐	○
Damaged	☐	○
Proper grounding	○	☐

	YES	NO
WIRE ROPE		
Broken wires at ends	☐	○
Broken wires excessive	☐	○
Excessive wear	☐	○
Kinked or distorted	☐	○
Corrosion	☐	○
Heat damage	☐	○
OPERATING CONTROLS		
Contactor pitting	☐	○
Operating properly	○	☐
Damaged Control Box	☐	○
LUBRICATION		
Oil leaks	☐	○
LABELS		
Missing	☐	○
Illegible	☐	○
DRUM & SHEAVES		
Worn excessively	☐	○
SUPPORTING STRUCTURE		
Continued ability to support imposed load	○	☐
Worn or distorted parts	☐	○

NOTE: IF ANY (☐) IS CHECKED DO NOT OPERATE THE HOIST UNTIL REPAIRS HAVE BEEN MADE!

Remarks and repairs made: ____________

Signature: ____________ Date: ____________ Clock Number: ____________

9-4 Hoist Specification LE501P1

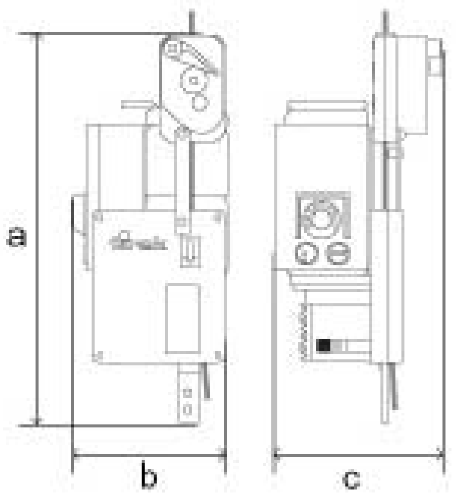


Figure 1001

Hoist Model			XE301P
with BLOCSTOP model			BSO 500
Rated Load	*lbs*		700.0
	kg		300.0
Lifting Speed	*ft/min*		35.0
	m/min		11.0
Weight (with BSO)	*lbs*		77.0
	kg		35.0
Dimensions over all	*a*	*in.*	28.9
		mm	735.0
	b	*in.*	11.2
		mm	286.0
	c	*in.*	12.5
		mm	314.0
Motor Specifications			
Single phase 110V / 60 cycles	Kw		
	A		10.5
Single phase 220V / 60 cycles	Kw		
	A		5.2
wire rope diameter	*in.*		5/16"
	mm		8.4

Misc. Info:
- Hoist shall self reeve the wire rope
- Continuously duty motor TEFC
- Secondary brake shall be externally attached to the hoist mechanism.
- Emergency lowering without power shall be by means of a mechanical centrifugal brake.

Wire rope classification/construction		5x19 or 5x26 with fiber core lubricated, preformed IPS or XIPS
nominal diameter	*in.*	5/16 in.
	mm	8.4 mm
maximum allowed diameter tolerances	*in.*	0.319 to 0.331
	mm	8.1 to 8.4
minimum actual breaking strength	*lbs*	10,000
	kN	44.5

Table 1003

TRACTEL Inc GRIPHOIST Division 110, Shawmut Road Canton, MA 02021 Tel: 800-421-0246 Fax: 781-828 3642 griphoist.usa@tractel.com	TRACTEL LTD GRIPHOIST Division 11020 Mirabeau St Anjou QUEBEC, H1J 2S3 Tel. +1 (514) 493 3332 Fax. +1 (514) 493 3342 griphoist.canada@tractel.com	TRACTEL Inc GRIPHOIST Division Branch Office: 315 Cloverleaf Dr. Building E Baldwin Park CA 91706 Tel. +1 (626) 937 6727 Fax. +1 (626) 937 6730

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